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Bulletin

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Crile on the Thyroid Gland

We believe this is the first published work from a group clinic, and is the first of a series of monographs to come from the Clinic of George W. Crile and Associates. It deals entirely with the *Thyroid Gland*—every phase of it. Each phase is presented by that member of the staff best qualified, because of specialized work, to discuss that particular phase. The contributions are arranged in sequence, starting with general papers, and then taking up in order function, diseases and pathology, diagnosis, prevention, preoperative treatment, surgical technic, postoperative treatment, summary, and statistics. Full and definite details for anoci-association and the use of nitrous-oxid-oxygen are given. The work is *strictly clinical* throughout, the contributions themselves telling the story of diagnosis and treatment, applying, in the interpretation of the symptoms in diagnostic terms, the years of experience in history-analysis, the technic of the laboratory, the sense of observation. Operative technic, of course, is given in clear, definite detail, and the many step-by-step illustrations further stress the important points.

The Thyroid Gland. By GEORGE W. CRILE, M.D., and ASSOCIATES, Cleveland, Ohio. Octavo of 288 pages, with 106 figures, containing 179 illustrations. Cloth, $5.00 net

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ENDOCRINOLOGY *

LEWELLYS F. BARKER, M.D.
BALTIMORE

This symposium on internal secretions includes several papers that deal chiefly with the physiologic, the pathologic and the therapeutic effects of endocrine substances. I have been asked to make, by way of introduction, some general remarks on the subject of endocrinology as a whole. A discussion of the topic is timely and should be of value to workers in every branch of medicine. The profession in general is evincing a lively interest in the internal secretions, as is shown by the titles of papers read at medical meetings. An association for the study of the internal secretions already has a large membership, and its special journal, *Endocrinology*, is widely read.

THE ENDOCRINE ORGANS

Organs of the body that yield to the blood, in addition to the common metabolites resulting from the general life processes of cells, certain specific products that influence distant parts have been designated "endocrine organs," and the special substances thus yielded are known as "internal secretions." These endocrine organs have sometimes been called the "glands of internal secretion" because their products are distributed to the circulating fluids of the body itself rather than to the world outside or to tubular canals that communicate with the external world. They have sometimes been called "ductless glands," to distinguish them from glands whose products emerge through epithelial lined channels; though it should be remembered that in some organs, like the pancreas, we have some parts producing an external secretion discharged through a duct, and other parts producing an internal secretion that is discharged directly into the lymph or blood without the intermediation of a duct. Recently, the endocrine organs have been spoken of as "incretory organs," the specific substances they produce being known as "incretions," to distinguish them from the "secretions" and the "excretions" of other glands.

The principal endocrine organs are the thyroid, the parathyroids, the thymus gland, the lymph glands, the suprarenal glands, the gonads, the hypophysis cerebri (or pituitary gland), the epiphysis cerebri (or pineal gland), and the insular tissue of the pancreas (islands of Langerhans), though it is quite possible that other organs, as the spleen, the kidneys, the liver, the salivary glands and the prostate, also perform endocrine functions in addition to their other physiologic activities.

In agreement with the idea that the specific substances produced by the endocrine organs are carried by the blood or lymph to distant parts, modifying the activity of the cells there, the term hormone was suggested for these substances by Bayliss and Starling. It is quite possible, however, that some of these incretions, instead of acting as excitants or depressants of distant cells, as the hormones are supposed to do, perform the function of neutralizing poisonous substances circulating in the blood. Such hypothetic detoxicants have been designated "negative incretions," to distinguish them from true hormones, or "positive recrementitious incretions."

FUNCTIONS OF THE ENDOCRINE ORGANS

The ways in which the specific products of the endocrine organs influence the rest of the body are gradually being found out. Progress has been especially rapid since the more exact chemical nature of some of the specific substances produced has been discovered, making it possible to apply more extensively experimental methods to the study of hormonal activities. Epinephrin, isolated from the chromaffin tissues, thyroxin from the thyroid, pituitary extract from the hypophysis cerebri, and, very recently, insulin from the islands of Langerhans of the pancreas, are notable instances of incretory substances, or extracts, useful for experimental work. Physiologic investigators, as well as pharmacologists, have been busily engaged in determining by animal experiment the influences of these substances, or extracts, when introduced by various routes, on the physiologic processes in the different organs and tissues. Clinicians are comparing, in diseased human beings, the effects of these purer substances or extracts with the effects producible by administration of the fresh, or dried, organ substance as a whole. It is scarcely conceivable that an endocrine organ produces only a single important substance, as thyroxin in the case of the thyroid or epinephrin in the case of the chromaffin tissue; it would seem probable that each gland may produce at least several substances, even though our attention may at present be focused on only one.

Many of our ideas concerning the functions of the individual endocrine organs have been derived from extirpation experiments in which the effects on the animal operated on have been noted and the curative influences of substitutive therapy (organ transplantation; dried gland administration) have been observed. Even more important, perhaps, have been the clinical-pathologic studies that have correlated either anomalies of constitution or disease syndromes with demonstrable pathologic-histologic alterations in the endocrine

* Address of the chairman of the Section on Practice of Medicine, read before the joint meeting of the Section on Practice of Medicine, the Section on Pharmacology and Therapeutics, and the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

organs and with demonstrable physiologic or chemical evidences of overfunction or underfunction of those organs.

Sufficient knowledge has been gained by these and other methods to make it seem clear that the incretions may act on distant cells in a modifying way either directly through transport through the blood to them, or indirectly through the intermediation of the autonomic nervous system. When they act directly, they may determine the way in which the energies and substances in the terminal cells are utilized (functional correlation), or they may supply substances that are actually made a part of the distant cells that receive them and use them for their nutrition or for structural change (formative influence). When they act indirectly through the intermediation of the autonomic nervous system, they may, by stimulating, favoring or inhibiting the fibers of that system, greatly modify the functions of the secretory and excretory organs of the body and of the involuntary musculature of the vascular, digestive, respiratory and urogenital systems.

Furthermore, either by direct stimulation of the nerve mechanisms concerned or by indirect influences on these mechanisms through the autonomic nervous system, endocrine products undoubtedly play an important rôle in the physiologic processes that are conceived of as running parallel to certain of the psychic functions, especially those that we designate as the affective and the conative. This relationship of the incretions to the psychic mechanisms would seem clear from clinical observation of pathologic emotivity and of pathologic behavior observable in various endocrine disorders, notably in exophthalmic goiter and in myxedema.

It is known, further, that profound effects are produced by certain of the incretions, especially those of the thyroid, the hypophysis and the gonads, through the regulation of the metabolic processes. Whether these effects, in turn, result from influences exerted directly by the hormones on the body cells or indirectly through the mediation of the autonomic nervous system must be left to further investigations to reveal. It would seem probable, however, that an acceleration of the general metabolism, such as can be induced by an excessive thyroxin production by the thyroid gland, may be due to a direct hormonal influence on the processes of combustion within the body cells, though it is conceivable that the same effects might be produced indirectly through hormonal action on a hypothetic metabolism-regulating center; located, say, in the interbrain. Similarly, one might speculate regarding localized morphogenic effects, such as the growth of the acra in acromegaly, which could be due either to selective hormonal influences on local groups of distal cells concerned in the growth processes, or to selective hormonal influences on local groups of trophic neurons of the autonomic nervous system.

THE SO-CALLED HORMONOPOIETIC SYSTEM

The conception that the endocrine organs are linked together so as to form a system of reciprocally dependent organs (hormonopoietic system) has gradually gained general credence, not only among clinicians, but also among physiologists and pathologists. And it must be admitted that there is considerable evidence in favor of the existence of such a correlative interdependence among the several incretory glands. Physiologists, through their experiments, have adduced many facts that point to manifold interrelationships between the glands of internal secretion. And clinical-pathologic studies have shown that uniglandular endocrinopathies are rare, whereas pluriglandular endocrinopathies are common. In exophthalmic goiter, for example, we see not only diffuse hyperplasia of the thyroid gland but also, not infrequently, hyperplasia of the thymus as well as signs of insufficiency of the gonads. In Froehlich's syndrome, to cite another instance, we see not only the signs of a disorder of the hypophysis cerebri but also evidences of hypogenitalism. It seems very probable, therefore, that in the chemical integration of the bodily activities a certain cooperation among the endocrine organs is essential. The hormonopoietic system is concerned as a whole. It, like the nervous system, helps to correlate the partial systems of the body into a harmonious unity.

EVOLUTIVE SIGNIFICANCE OF THE INCRETIONS

That the substances produced by the incretory organs are of great importance in the development of the individual, not only during embryonic life but also during the further evolution of the organism to the acme of its development, is now a generally accepted view. The ontogeny of the single organism depends on reactions that occur between the germ plasm of the fertilized egg cell, on the one hand, and the environment (prenatal and postnatal) on the other. The fertilized germ plasm, consisting of a complex of "gens," constitutes the so-called "genotype," which determines the modes of reaction that are manifested during development. Environmental influences (at first chemical and physical, later on also psychic and social) are the other factors that are concerned in the development of the single creature. The resultant of the interaction of these environmental influences on the one hand, and the inherited influences on the other, is the "realized organism," or, in the case of human beings, the "realized person." This realized person is sometimes spoken of as the "phenotype." The inherited or constitutional factors (genotype) are known as the "determination factors" in development, whereas the conditioning influences of the environment are known as the "realization factors" (Roux). The part contributed by the germ plasm to the phenotype is known as the "constitution" of the individual, whereas the part contributed by the environment to the same phenotype is known as his "condition."

Students of heredity have long been interested in tracing the mode of development of the realized qualities or traits from their potentialities in the gens. It now seems clear that, in this evolutive process, hormonal substances derived from the endocrine organs are of prime importance. The functioning of the endocrine glands during development depends in part on their genotypic origin and in part on the modifying influences exerted on these glands at different stages of development from the environmental side. It seems probable that a more exact understanding of racial peculiarities, of normal constitutional types or personal variants, and of pathologic anomalies of constitution will depend on our acquiring a more precise knowledge of endocrine activities during development.

The general dimensions as well as the relative proportioning of the body are certainly in large part dependent on the incretions acting as morphogenic stimuli. These stimuli determine not only the development of the skeleton and the closure of the epiphyseal

lines but also the development of the soft parts. In a word, both the form relations and the functional manifestations of the phenotype are largely the result of endocrine activities. The origin of the bodily features and a whole series of local and temporal maturations depend in the developing individual on a correlative differentiation that is largely determined by the functioning of the endocrine glands. The special species characters, the special age characters, and the special sex characters of the realized person find their explanation here. So, too, the strange faults of composition of the human body, the various bizarre anomalies of constitution that we see, apparently owe their origin to endocrine disharmonies of the earlier developmental periods, disharmonies that are usually of genotypic origin, though they may sometimes, perhaps, be due to extraconstitutional, or so-called conditional, abnormalities.

The task of the endocrinologist in unraveling the specific influences of the single endocrine glands on growth and development is one of extreme complexity, but nevertheless one in the solution of which gratifying progress is being made. How far during intra-uterine life incretions derived from the mother (so-called "harmozones" of Gley) may reach the fetus and participate in morphogenesis (normal or pathologic) is a further task in which students of constitution and condition must sooner or later become interested.

INVOLUTION AND ITS ENDOCRINE RELATIONSHIPS

After the body and the psyche reach their acme of development as the result of a long series of evolutive processes, a reverse process gradually sets in, both body and mind being subject, no matter how good the constitution or how favorable the environment, to gradual but progressive involution. Physical and mental endurance lessen; the hairs grow gray or fall out; the skin becomes wrinkled; the teeth fall out; the stature lessens; the metabolic processes become retarded; interests change; desires begin to fail, and memory becomes uncertain. In other words, the person "grows old." Coincident with the appearance of these involutive phenomena there seem to be changes not only in the endocrine glands themselves but also in the terminal organs on which their products operate. In pathologic constitutions, in which the complex of gens in the genotype has been deficient, one or more of the involutive phenomena may prematurely appear. Doubtless, too, persons of normal constitution who have been exposed over a prolonged period to very unfavorable environmental influences may become the victims of a precocious senium. Some of the so-called heredofamilial diseases of the nervous system are probably examples of premature involutive processes affecting partial constituents of the organism, though how far, if at all, abnormal endocrine functions are responsible, we do not yet know. Exact studies of the various processes of involution and their relations to the incretions will provide an abundance of work in the future for investigators of normal and pathologic physiology.

CLINICAL RECOGNITION OF ENDOCRINE ABNORMALITIES

The clinical recognition of the endocrinopathies has been greatly aided by the observation of human beings in whom single glands have been removed surgically, have been severely traumatized, or have suffered destruction by disease. The findings in human beings have been manifoldly corroborated by experiments on animals. The studies of myxedema due to loss of the thyroid, of tetany due to loss of the parathyroids, of dystrophia adiposogenitalis due to injuries of the hypophysis, eunuchism due to loss of the gonads, of Addison's disease due to destruction of the suprarenals, and of diabetes mellitus due to injury to the islands of Langerhans, have thrown a flood of light on endocrine domains. Studies of overfunction and of dysfunction have been similarly rewarding. But various permutations and combinations of symptoms and signs that are possible in complex endocrinopathies make their study exceptionally difficult. We are only on the threshold of that knowledge that we hope ultimately to possess.

THERAPY OF THE ENDOCRINOPATHIES

Though the principles of therapy for the endocrine diseases are not hard to grasp, the application of these principles in practice is compulsorily restricted, owing to the fragmentary character of existing knowledge. When, through constitutional deficits, or through unfavorable conditional influences, disharmonies of the hormonopoietic system arise, and evidences of hyperfunction, of hypofunction or of dysfunction, of one or more of the single endocrine organs appear, therapeutic intervention may become desirable. Thus, in the various constitutional anomalies that seem to be dependent on endocrine imbalance, prophylactic measures may be undertaken with the object of maintaining the subjects of these anomalies within the limits of normal responsivity. We attempt by adequate measures to counteract in such persons the special disposition to disease that the constitutional anomaly entails. When a disease process has already developed, in other words, when an endocrinopathic personal variant has become incapable of satisfactory adaptation (state of irresponsivity), the physician may attempt to decrease function here, to increase function there, or to modify function elsewhere, in the hope of restoring balance, and of bringing the powers of personal adaptation again within the limits of normal responsivity. Thus, in hyperfunction of an endocrine organ it may be desirable to excise a portion of it, or to curtail its activity by diminishing its blood supply (ice-bag; arterial ligation); or, by means of a depressive radiotherapy or chemotherapy. On the other hand, in the case of hypofunction, it may become desirable to resort to organ transplantation, or to a substitution therapy (administration of gland substance, or of gland extracts, or of isolated hormones), or to attempt to revive a failing function by a dietetic hygienic regimen, or by mild stimulative radiotherapy.

The field for endocrine therapy is undoubtedly a large one, but how most effectively to work in it, we must slowly and painstakingly ascertain. Relatively little is gained, and much harm can be done, by reckless, ill-planned, fumbling attempts at incretory therapy. Much better is it to proceed patiently, cautiously and methodically, rigidly controlling every step, and faithfully recording our failures as well as our successes. Only slowly will it be possible to acquire the knowledge and the technic that will permit a physician properly to help the single endocrinopathic patient. As yet we are far from being able satisfactorily to disentangle in a given person the complex, interacting determination factors and conditioning factors that account for a given endocrinopathy. Adequate disentanglement of these factors is, however, the goal toward which we must strive.

SOME CONDITIONS CONTROLLING INTERNAL SECRETION *

W. B. CANNON, M.D.
BOSTON

No one may now question the great influence of the glands of internal secretion on important physiologic processes. The growth of the body, the proper development of the nervous system, the appearance of secondary sex characters, the orderly sequences in the reproductive cycle, the nature and rate of chemical changes in the body—all these fundamental processes seem to be in the grip of the endocrine organs. Agents which can determine whether an individual shall be a giant or a dwarf, an idiot or a normally intelligent person, a "sissy" or a real male, a bearded lady or a woman; agents which are essential to normal metabolism—indeed, whose destruction may lead promptly to death—must evidently be respected.

There appears to be a tendency just now, however, to pay these glands not only respect, but reverence and homage and a blind worship. The endocrine organs are referred to as "regulators of metabolism" and as "regulators of personality," as if they occupied an imperious position in our internal economy, and the other organs were mere servants to do their bidding. This is a concept which is largely based, I believe, on the marked effects of either the destruction of endocrine glands or the development of tumors and other pathologic states within them. When a gland is destroyed it is gone forever, and its absence tells us nothing about how it worked or the modulations of activity it may have had. On the other hand, tumors *are* dictators in relation to the rest of the body, living riotously outside the law.

Thus, two extreme conditions, neither of them normal nor even remotely physiologic, have led to the assumption of an endocrine almightiness. Is that the mode of organization of the body? Is our internal government autocratically ruled by a czar or a kaiser or by groups of kings and princes, represented by the ductless glands, or is there a more democratic arrangement whereby influences pass to and fro among the various parts of the organization and, after many mutual adjustments, finally express themselves in function?

The physiologist regards the body in the latter sense —as a system of organs, each performing its service, each influenced by other organs and capable in turn of influencing other organs, and each having a use and a value only in relation to the others.

Questions now arise regarding the real status of the glands of internal secretion. If they have not the dominant position commonly assumed for them, how may they be subordinated? What influences can be brought to bear on them in such a way as to modify their activity? These are important questions to have answered—important because of the profound effects which the ductless glands themselves are capable of exerting. In a brief survey I propose to present some of the evidence for physiologic control of the internal secretions.

EVIDENCE FOR NERVOUS CONTROL

We now have evidence that at least the suprarenal medulla, the liver and the thyroid gland are subject to sympathetic nerve impulses. Stimulation of the splanchnic nerves causes a discharge of epinephrin from the suprarenal glands into the blood stream in an amount which markedly affects other organs. Such stimulation also liberates sugar from the liver. Uridil and I [1] have shown that under stimulation the liver yields another substance which raises blood pressure and causes an acceleration of the denervated heart. Furthermore, Smith and I [2] recently described experiments that confirm earlier work and testify to the efficacy of cervical sympathetic stimulation in calling forth a secretion from the thyroid gland.

It is well known that the sympathetic division of the autonomic system is brought into action by pain, asphyxia and great emotional excitement. That the three endocrine organs mentioned above may be strongly influenced by such conditions has been proved by numerous observations made both on experimental animals and in clinical cases. Extra epinephrin circulating in the blood when a sensory nerve is stimulated or signs of rage are evoked can be demonstrated by a faster beat of the denervated heart.[3] Emotional hyperglycemia or glycosuria, due doubtless to extra sugar freed from the liver, has been observed in cats disturbed by barking dogs, in students undergoing severe examination,[4] in aviators,[5] and in citizens terrorized by bombardments and air raids.[6] The thyroid likewise may be stimulated by painful and asphyxial conditions. Smith and I were able to obtain quite as striking results by such stimuli as we obtained by direct excitation of the cervical sympathetic strand. The considerable number of cases of exophthalmic goiter reported as occurring in consequence of stressful circumstances during the war [7] may perhaps be taken as additional indication of an influence on the thyroid gland exercised by the sympathetic nervous system.

Another gland which may be affected by nerve impulses is the posterior lobe of the pituitary. Weed, Cushing and Jacobson [8] have reported that stimulation of the superior cervical sympathetic ganglion induces glycosuria (even though all nervous connections with the abdominal viscera have been severed), and that the result fails to occur if the posterior lobe of the pituitary has previously been removed. In harmony with this result is Shamoff's testimony that the same stimulation induces, besides glycosuria, such diuresis as is induced by pituitary extract.[9] The inference that a hormone is discharged from the pituitary as a result of stimulation has been somewhat invalidated by Rabens and Lifschitz,[10] who were unable to produce glycosuria by stimulating under physiologic conditions or to modify the glycosuria due to ether. Furthermore, though Keeton and Becht [11] did augment the reducing substance in the blood by direct excitation of the pituitary, the effect was abolished by severance of the splanchnic nerves. A nervous control of secretion from the posterior lobe of the pituitary is therefore in question.

* From the Laboratories of Physiology of the Harvard Medical School.
* Read before the joint meeting of the Section on Practice of Medicine, the Section on Pharmacology and Therapeutics, and the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

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2. Cannon and Smith: Am. J. Physiol. **60**: 476, 1922.
3. Cannon, W. B.: Am. J. Physiol. **50**: 399 (Dec.) 1919.
4. Folin, Denis and Smillie: J. Biol. Chem. **17**: 519, 1914.
5. Marañon, G.: Siglo. méd. **68**: 573 (July 19) 1919.
6. Etienne and Richard: Revue méd., Oct. 12, 1918.
7. Marañon, G.: Ann. de méd. **9**: 81 (Feb.) 1921.
8. Weed, Cushing and Jacobson: Bull. Johns Hopkins Hosp. **24**: 40, 1913.
9. Shamoff, V. N.: Am. J. Physiol. **39**: 279 (Jan.) 1916.
10. Rabens and Lifschitz: Am. J. Physiol. **36**: 47, 1914.
11. Keeton and Becht: Am. J. Physiol. **39**: 109, 1915.

Thus far, attempts to prove that internal secretion of the pancreas is subject to sympathetic impulses have proved futile. Allen [12] has testified to his inability to secure any indication of such nervous control, and von Noorden [13] has declared that he has not seen any influence of the excitements of war in producing true diabetes. Indeed, in the Central Empires, where the food shortage was marked, the deaths from diabetes were fewer toward the end of the war, despite the increasing nervous stress, than they had been at the beginning.[14] According to de Corral,[15] however, stimulation of vagus fibers below the branches to the heart results in a reduction of the sugar content of the blood. This research, not yet confirmed, offers the only hint of which I am aware that the islet cells may be governed by nerves.

Nervous control of ductless glands involves the idea that they, like other structures governed by nerves, have their activities adapted to the needs of the body at different times. That the organism survives and lives normally when nerves to the suprarenal [16] or thyroid [17] gland are severed is not proof that the nerves are useless, any more than the continued service of the denervated heart as a pump is proof that the vagus and accelerator nerves are useless. The nerves may have, in relation to the glands, just as in relation to the heart, a tonic action for routine purposes; and at times of critical need they may have a special, or what I have called an "emergency" function, capable of rapidly mobilizing the bodily forces, internal secretions included, for the welfare of the organism as a whole.

No better illustration could be given of the tendency to regard the internal secretions as supreme and the nervous system as quite subordinate than in the theory underlying the clinical conceptions of vagotonia and sympathicotonia. Indeed, Eppinger and Hess,[18] the authors of the theory, have concluded that "the entire vegetative nervous system is under the control of the glands of internal secretion." Epinephrin is, indeed, able to reproduce almost all the changes that occur when sympathetic impulses are discharged. It has been supposed, therefore, to exercise a tonic action on sympathetic endings. For example, the height of arterial pressure is assumed to depend on the constant discharge of epinephrin into the blood stream, and a low blood pressure is ascribed to "hypo-adrenia." In order to have an antagonist for epinephrin—some substance which would take command of the opposing forces—Eppinger and Hess have conjured up a hypothetic hormone, "autonomin," acting like pilocarpin and physostigmin on the nerve endings of the cranial division of the automatic system. This assumed entity, first predicated in 1910, has never had the fortune of a real existence. Nevertheless, clinical literature has been rife with descriptions of cases with vagotonic and sympathicotonic dispositions.

It is well to recognize that there is no good evidence that epinephrin has any tonic effect in maintaining blood pressure. Aub [19] has measured the pressure four or five days after removal of both suprarenal glands and found it normal. Since epinephrin disappears from the blood a few minutes after it is injected or secreted, the continued normal pressure cannot be due to persistence of that substance in the blood. Stewart and Rogoff [16] have severed the nerves to one suprarenal gland and removed the other. Practically no demonstrable amount of epinephrin is secreted under such circumstances, and yet the animals remained for months in quite good condition. Gley and Quinquaud [20] have shown that vascular reflexes occur fully as effectively with the suprarenal glands absent as they do when the glands are present. Furthermore, Hoskins and McClure [21] pointed out, years ago, that an amount of epinephrin required to cause a rise of blood pressure is sufficient to stop all motions of the stomach and intestine. A ridiculous mechanism it would be that would stop digestion in order to provide a few extra millimeters of arterial tension! There is no satisfactory evidence that, in natural quiet existence, the suprarenal medulla gives off any secretion whatever. In times of stress it is brought into action by nerve impulses and may, indeed, then support the influence of the sympathetic system, and have besides special functions of its own.[22]

The general arrangement of the sympathetic division is favorable to diffuse and widespread action in which a distributed chemical agent could participate. The vagus endings and the endings of the other parts of the cranial autonomic division lie in or near the organs innervated, and are therefore favorable to separate and discriminating action. By means of the general diffuse action of the sympathetic, and the opposite particular action of the parts of the cranial autonomic supply, every variety of change is provided for. All the viscera can be affected simultaneously in one way or the other through increased or decreased tone of the sympathetic division. And any special organ can be separately affected one way or the other through increased or decreased tone in the special nerve of the opposed cranial division that is supplied directly to the organ. The sympathetic is like the soft and loud pedals, modulating all the notes together; the cranial autonomic is like the separate keys.

A dilated pupil, for example, due to increased sympathetic activity attending excitement, should be accompanied by a rapid heart rate, vasoconstriction, stoppage of the motions of the stomach and intestine, and other evidences of widespread sympathetic influences. Epinephrin secreted at the same time would act synergistically with the nerve impulses. On the other hand, constriction of the iris by action of the motor oculi when the light is strong may not be accompanied by disturbance of any other part of the cranial autonomic supply to the viscera. Indeed, there is no conceivable advantage in having a mechanism in which strong light would result not only in a smaller pupil, but also in a slower heart rate and an increased tone of the gastro-intestinal tract. As one can readily perceive, a single substance, "autonomin," acting extensively, like pilocarpin, on cranial autonomic endings, might have most disorderly effects in forcing to operate coincidently and in an unadapted manner organs whose functions in calm existence are not importantly related to one another.

12. Allen, F. M.: J. Metabol. Res. **1**: 53 (Jan.) 1922.
13. Von Noorden, C.: Med. Klin. **12**: 991 (Sept.) 1916.
14. Magnus-Levy: Deutsch. med. Wchnschr. **56**: 1150, 1919.
15. De Corral: Ztschr. f. Biol. **58**: 395, 1918.
16. Stewart, G. N., and Rogoff, J. M.: J. Pharmacol. & Exper. Therap. **10**: 1 (July) 1917.
17. Manley and Marine: Proc. Soc. Exper. Biol. & Med. **12**: 202, 1915.
18. Eppinger and Hess: Vagotonia, English translation, New York, 1915, p. 9.
19. Aub: Am. J. Physiol., to be published.
20. Gley and Quinquaud: J. de physiol. et de path. gén. **17**: 807, 1918.
21. Hoskins, R. G., and McClure, C. W.: The Adrenal Glands and Blood Pressure, Arch. Int. Med. **10**: 343 (Oct.) 1912.
22. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage, New York, 1915, p. 184.

The ill-based theory of vagotonia has almost no respectable evidence to support it. Not only the criticism of laboratory workers but also the testimony of clinical observers has done much to discredit it. Cases are cited in which patients are equally hypersensitive to epinephrin and pilocarpin,[23] in which pilocarpin, atropin and epinephrin produce practically identical effects on the blood,[24] in which both atropin and epinephrin will stop auricular fibrillation,[25] and in which careful studies on various bodily functions showed no consistent sensitization to either the "sympathicotonic" or the "vagotonic" drugs. In the presence of the foregoing evidence, "vagotonia" becomes merely a name—a name which, as applied to the entire cranial autonomic division and presupposing a general reinforcing and vagotonic hormone, is wholly without meaning.

Reference was made above to the fact that activity of the sympathetic system may be varied up or down. Strong stimulation of an afferent nerve will cause vasoconstriction and other indications of diffuse sympathetic discharge, including suprarenal secretion. On the other hand, stimulation of the central end of the depressor nerve will cause vasodilation and a checking of any suprarenal secretion which may be going on.[26] Quite possibly, therefore, conditions may exist in the body, characterized by either greater or less sympathetic tone than normal; but such states would not be determined by independent dominance of suprarenal secretion, for, as shown above, lack of any secretion at all does not lessen the efficacy of sympathetic impulses, and extra secretion is ordinarily dependent on the effect of nerve impulses. The condition of the nervous system, not of the suprarenal medulla, therefore, is of primary moment.

In the foregoing review, evidence has been adduced to show the subjection of certain endocrine glands to nervous government. This emphasis, however, should not be interpreted as implying an independent dominance of the nervous system, for it, like other systems, is conditioned in its activities. Again I wish to lay stress on the fact that the body is an organism, and that the parts collaborate and exercise mutual influences on one another.

EVIDENCE FOR HUMORAL CONTROL

Nerves have been described as present in other of the endocrine glands than those mentioned above—for example, in the anterior lobe of the pituitary body [27] and in the parathyroid bodies.[28] On the other hand, it is reported that no nerve fibers are distributed to the interstitial cells of the testis, and very few to the suprarenal cortex. Nevertheless, both these structures may undergo hyperplasia, associated, at least in the case of the interstitial tissue, with seasonal depression at times of sex activity.[29] Evidently some other mode of control besides nerve impulses must prevail in such conditions. And since the blood stream alone brings the glands into relation with other parts, it is naturally assumed that the influences affecting the glands and passing away from them are conveyed in the circulating blood. In other words, the influences are of the humoral type.

The presence of a nervous control of internal secretion does not preclude a humoral control. Thus, the heart and the stomach and intestine are readily influenced by nerve impulses. But they are likewise affected by epinephrin discharged by the suprarenals, i. e., by a humoral agent. Also the thyroid, though subject to nerve stimulation, is responsive to chemical factors brought by the blood. For example, Cattell and I [30] found some years ago that stimulation of a discharge from the suprarenal medulla would cause an electrical action current in the thyroid.

When we begin to consider the evidence for interrelation of the ductless glands, we find ourselves in a maze of complex possibilities, contradictory reports and uncertain inferences. Much of the evidence is derived from distant effects of ablation or destruction of one or more of the glands, or from changes due to tumor growth, or to feeding gland substance. None of these circumstances can be regarded as physiologic. The results may be suggestive of *some* relation between the gland removed, or abnormal, or fed, and the other gland or glands which are altered thereby. But it is hazardous to draw inferences from pathologic states relative to physiologic processes. And even if there is *some* relation, we have not made satisfactory progress until we know what the relation is, the way it works and its full significance. If we knew nothing of the function of the heart and as much as we now know about the endocrine organs, we might be led to infer that the semilunar valves exercise an inhibitory influence on the growth of the heart; for does not destruction or injury of the valves result in an enlargement of that organ? Do we reason any better than this in many of our inferences from the effects of experimental removal of the endocrine organs? We know almost nothing, for example, about the normal functioning of the suprarenal cortex. Several observers have confirmed Hoskins' [31] observation that feeding thyroid gland enlarges the suprarenal body, especially the cortical portion, according to Herring.[32] It is reported to be enlarged also by starvation [33] or by a diet deficient in vitamins.[34] And Gley [35] and also Carlson [36] have found enlargement of the suprarenal bodies after removing the thyroid glands. Is the enlargement due to stimulation by the thyroid, or is it compensatory to increased metabolism, or is it a biologic response conservative of important bodily material when the supply is low or is being rapidly consumed? These are some of the possibilities. Certainly, in the presence of these complexities one has no clear idea of thyroid influence on suprarenal function.

Possibly too much emphasis has been laid on mere changes of size. More than thirty years ago, Rogowitsch [37] first noted that thyroidectomy is followed by hypertrophy of the pituitary body. This observation has been confirmed by numerous investigators. Kamo,[38] who removed the thyroid from young dogs, found, after a few months, marked pituitary enlargement, even to more than twice the normal size, manifested chiefly in the anterior lobe. We commonly associate hypertrophy with extra activity, and we have

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27. Berkeley: Brain **17**: 515, 1894.
28. Schäfer: The Endocrine Organs, London, 1916, p. 21.
29. Tandler and Gross: Arch. f. Entwicklungsm. **33**: 297, 1911.
30. Cannon, W. B., and Cattell, M.: Am. J. Physiol. **41**: 74 (July) 1916.
31. Hoskins: Am. J. Physiol. **26**: 426, 1910.
32. Herring: Quart. J. Exper. Physiol. **11**: 47, 231, 1917.
33. Byrne, C. H. C.: Brit. M. Jour. **2**: 135 (Aug. 2) 1919.
34. McCarrison, R.: Brit. M. J. **2**: 236 (Aug. 14) 1920.
35. Gley: Arch. internat. de physiol. **14**: 175, 1914.
36. Carlson, A. J., in discussing Cannon, W. B.: Results of Recent Studies on Ductless Glands, J. A. M. A. **67**: 1483 (Nov. 18) 1916.
37. Rogowitsch: Beitr. z. path. Anat. u. z. allg. Path. **4**, 1889.
38. Kamo: Jap. Med. Lit. **3**: 33, 1918.

evidence that extra activity of the anterior lobe of the pituitary body is attended by an overgrowth of the skeleton. Animals deprived of the thyroid, however, are stunted in growth. Here we have an instance of hypertrophic change in one gland induced by removal of another, but with no corresponding hyperfunctional effect.

Perhaps we shall have clearer signs of the cooperation of the endocrine organs if we consider briefly the influence of various representative glands on a common function. For illustrative purposes I propose to call attention to some of the effects of the glands on certain bodily processes, which were mentioned earlier —growth, reproduction and metabolism.

The relation between overgrowth of the skeleton, as in gigantism and acromegaly, and hyperplasia of the anterior lobe of the pituitary, is now fairly well established. Extra skeletal growth is also associated with early castration. On the other hand, both clinical and experimental studies point to early pituitary deficiency as causing failure of bony development. This form of dwarfism is characterized by both short and slender bones. A third gland whose function is essential to growth is the thyroid, for in its absence the stature is stunted. Here are three endocrine organs, all having marked influence on the attainment of normal size. One could readily speculate as to how they influence one another—the pituitary and thyroid appearing to work cooperatively and the gonads acting as a check on them—but we need facts rather than speculation.

Reproduction depends on the gonads, of course, but it also depends on the thyroid and the pituitary glands. If the young animal is deprived of either the thyroid or the pituitary, the generative organs are only slowly or imperfectly developed, so that a condition of sexual infantilism persists. Hyperplasia of the pituitary, and also of the suprarenal cortex, in the young, is sometimes associated with precocious sexual maturity and activity. Both the thyroid and the suprarenal cortex become enlarged during pregnancy. Thus, the evidence seems to point to the thyroid and the pituitary glands and to the suprarenal cortex as factors essential to proper establishment of the reproductive function, and also possibly collaborating, in the female, in the performance of that function.

The pancreas, the suprarenals and the liver primarily, and likewise the thyroid and the pituitary, are all concerned with carbohydrate metabolism. As is well known, excision of the pancreas results in diabetes, stimulation of the liver or injection of epinephrin increases the sugar in the blood, and removal of either the thyroid or the pituitary raises the assimilation limit of sugar. Diabetes is occasionally associated with acromegaly and with exophthalmic goiter. Probably all five of the glands mentioned above either cooperate or form a fairly stable combination of opposed influences. But, again, how these organs are interrelated in their effects on metabolic processes is not at all clear.

In the foregoing paragraphs I have merely hinted at some of the signs of cooperation among certain endocrine glands. My purpose in doing so was to make the point that here, just as in the nervous government of internal secretion, there are indications that we are dealing with arrangements which are normally well ordered and subject to automatic control. Bodily functions are managed by a system of checks and balances—by mutual adjustments such as those between antagonistic muscles, and by maintained equilibria, such as those between material income and outgo, and between acid and base in the blood. We are justified by what we already know of bodily organization in looking for similar modes of restraining and releasing the internal secretions. If the endocrine glands are regarded as the regulators of important physiologic processes, normally they are well regulated regulators. Much work must still be done, however, before we shall know the mechanisms whereby the control of these agents is exercised. But the work is highly important because of the potency of the endocrine organs when they are deficient or when they escape control and through pathologic activity play havoc with our internal adjustments.

THE RELATION OF THE INTERNAL SECRETIONS TO METABOLISM*

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Among the various functions ascribed to the glands of internal secretion, the regulation of metabolism ranks high. Not only is it a very important part of their activity, but it is also the function about which the greatest and most accurate knowledge has been accumulated. Of course, the general regulation of metabolism is not wholly controlled by the glands of internal secretion, for there are many other factors which exert influences which cannot now be ascribed to the activity of these glands. Examples are found in the effect of exercise, the specific dynamic action of foodstuffs, fasting, sleep, etc., and it therefore cannot be assumed that these endocrine glands absolutely control the rate of metabolism. But there can be no doubt that their general influence is great.

As far as our knowledge goes, this influence is largely exercised on the heat production as a whole rather than on individual components of metabolism, such as the carbohydrates or salt. This is not true of all of the glands. The pancreas has a differential action and exerts its regulatory effect largely upon the utilization of carbohydrate. It is also possible that the parathyroids have some isolated influence on the metabolism of inorganic salts.[1] It is also true that the metabolic effects of other glands may be developed predominantly from one foodstuff, as in the combustion of carbohydrate after the administration of epinephrin;[2] but, in general, apart from the action of the pancreas and the parathyroids, the effect on the total rate is a fairly good index of the general influence of the glands on the body metabolism, at least as far as we know.

The effect of each gland on the metabolic rate has been the subject of considerable recent investigation, so that a short summary of the work is difficult. It is probably true that many glands credited with various effects produce these effects by indirect reactions on other glands, so that they are really merely indications of interrelationships. The problem of interrelationships among these endocrine glands is difficult and

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2. Boothby, W. M. and Sandiford, I.: The Relationship of the Increase in Blood Sugar Concentration to the Specific Dynamic Action of Glucose and to the Specific Dynamic Action of Adrenalin, Am. J. Physiol. 55: 293-294, 1921.

should be discussed only when based on careful experimental data. It is with this point of view in mind that I shall undertake, first, to show that probably only two glands, the thyroid and the suprarenals, are fundamentally and chiefly involved in the regulation of the total metabolic equilibrium; and, second, to suggest the mechanism of their action as fully as present knowledge will permit.

A summary of the literature discloses the fact that there are four glands to which are attributed an influence on the rate of metabolism.[3] Of these, the thyroid gland stands preeminent, and its stimulating action is so well known that further discussion is not essential here. The gonads are also a factor, although a minor one. Their removal is followed, after a period of about three weeks, by a fall in metabolism, as has been shown by Loewy and Richter,[4] Luethje,[5] Murlin [6] and others. Korenchevski,[7] taking the data of his pupil Rovinski,[8] showed that this fall of metabolism after castration largely disappeared if the thyroid gland was first removed. He therefore concluded that the effect of the gonads on metabolism was accomplished through an interrelation with the thyroid gland, and that the lowered metabolism following castration was due to a depression of thyroid secretion rather than directly to absence of the gonads.

The influence exerted by the anterior pituitary is similar to that of the gonads, in that, after extirpation, there is a gradual reduction of the basal metabolic rate. This was first shown by Benedict and Homans.[9] Sometimes one finds, clinically, changes in the rate of metabolism of patients with active disease of the pituitary; but this is not a constant finding. Boothby has recently stated (at the Society of Clinical Investigation) that, in his experience, these changes in acromegalias were always found in those patients who also showed some thyroid involvement. It is therefore possible, although it has not been finally proved, that the metabolic effects of the pituitary are accomplished through the thyroid just as, probably, in the case of the gonads. Administration of the glandular products of these two, however, has not affected the metabolism consistently, and further work needs to be done along these lines.

The fourth organ which regulates the metabolism is the suprarenal. This is a recent discovery. Most of the work on this subject has been of a pharmacologic nature, by the subcutaneous and intravenous injection of large doses of epinephrin, as in the experiments of Tompkins, Sturgis and Wearn,[10] Sandiford [11] and others. Their results have shown that there is an invariable rise of metabolism, which develops and disappears within a period of minutes. Boothby and Sandiford showed that this could not be explained by a mere mobilization of glucose.[2] These pharmacologic observations suggested that the secretions of the suprarenal glands, as they occur physiologically, might play a rôle in the regulation of metabolism; and Miss Bright, Dr. Forman, Dr. Uridil and I [12] have studied this possibility. We found that removal under ether anesthesia of the suprarenal glands of cats was followed by a rapid reduction of the metabolic rate. This occurred while the animal was still in good condition, and persisted until the final collapse.

At the meeting at which these experiments were reported, Marine [13] announced his results with rabbits: he laid stress on a belated and temporary increase in metabolism, which he has subsequently [14] interpreted as due to secondary thyroid activity. We have not investigated the transient rise in metabolism which he reports; but we have studied the fall of metabolism obtained so definitely in cats. It was found that if the suprarenal glands were removed under urethane anesthesia, the fall in metabolism appeared shortly and tended to progress. In these experiments, the cat remained in an anesthetized condition throughout the entire observation. The observed fall in metabolism was not affected by injections of extracts of the suprarenal cortex, but could be eliminated by intravenous injection of epinephrin administered at a rate which is said to be physiologically probable in life, according to Stewart and Rogoff,[15] and Cannon.[16] This has recently been confirmed by Boothby and Sandiford [17] in the dog with intact suprarenals. Such results are certainly good evidence that the suprarenal glands may play a part in the variation of the metabolic rate by means of the normal secretion of epinephrin. Clinical evidence for this is not so readily found, but it is probably seen in the high metabolic rates often found in the first observations made on excited patients. It is not rare to find an untrained nervous subject who is emotionally disturbed by the procedure of the test. Such patients may then show a higher metabolic rate than they display later, even though they remain quiet. According to the emergency theory of Cannon,[18] it is during such excitement that epinephrin would be secreted. In the few cases of Addison's disease reported with metabolic studies, evidence of reduced metabolism has been shown either by the nitrogen elimination or by the basal metabolic rate; but these cases are still too few to generalize about.

Are the metabolic effects of thyroxin and epinephrin independent? Marine [19] has shown that the increase

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18. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage, New York, D. Appleton & Co., 1915.

19. Marine, David, and Lenhart, C. H.: The Influence of Glands with Internal Secretion on the Respiratory Exchange, I, Effect of the Subcutaneous Injection of Adrenalin on Normal and Thyroidectomized Rabbits, Am. J. Physiol. **54:** 248-260, 1920.

of metabolism which follows the injection of epinephrin may be obtained in animals which have been previously deprived of their thyroid glands. Similarly, we have shown that the reduced metabolic rate following suprarenalectomy under urethane and the stimulating effects of epinephrin when it is injected at a physiologic rate are demonstrable in animals either with or without the thyroid gland. It is therefore clear that the thyroid gland is not an essential factor in the action of epinephrin on metabolism. That the converse of this is true, that the suprarenal glands are not essential for the continued stimulation of metabolism by thyroxin, may be shown in the following manner: The metabolic rate is raised above normal by the injection of thyroxin. If the suprarenal glands are now removed, the metabolic rate does not fall to normal but is maintained at a high level for many hours, so that the high metabolic rate in hyperthyroidism is not dependent on the presence of the suprarenal gland or its secretions. It is therefore fair to assume that the calorigenetic effects of thyroxin and epinephrin are distinct and not interdependent. The time relations of their actions also differ distinctly. Studies at the Mayo Clinic first revealed that the metabolic effects of the injection of thyroxin are manifest only after many hours and last for days. Epinephrin, on the contrary, produces effects within minutes, not hours, and likewise loses its influence after a brief period. All these facts have led me to the theory that there is a double endocrine mechanism for regulating the metabolic rate; that some of the acute fluctuations of basal metabolism may be ascribed to the influence of the suprarenal glands, and that the thyroid is more sluggish, but probably more important in its regulatory action.[12] Such a mechanism would be analogous to the control of the acid-base equilibrium of the blood, as demonstrated by L. J. Henderson, in which the lungs and kidneys share the burden, the lungs making the necessary immediate adjustments by the excretion of carbon dioxid, the kidneys, acting more sluggishly, by the excretion of phosphates.

What is known about the way in which these hormones accomplish their metabolic effects? This is a field in which further investigation is needed. Most work has been directed to determining the nature of the metabolic effects rather than to determining how they are accomplished. But we do know some facts. Thus it has been found by Lovatt Evans [20] that epinephrin will stimulate the isolated heart to more rapid contractions and to a markedly increased metabolism. Recently, Martin and Armitstead have shown [21] that an isolated resting muscle has a higher metabolism, as denoted by acid production, when in the presence of epinephrin than when no epinephrin is present. These two experiments point to the action of epinephrin as a direct one, capable of influencing metabolism by affecting peripheral muscle tissue directly, as Boothby suggested. There is apparently no need of the central nervous system or of other internal secretions as accessories to its stimulating action, but it must work as a direct metabolic stimulant either on the nerve end plates or on the muscle cells themselves.

No such clear evidence exists, however, in support of the theory that the thyroid acts on cells by stimulating them directly to increased heat production. It is, of course, a more difficult problem because there is so long a latent period before thyroxin manifests its effects, so that no rapid experiments can be made. One might determine the metabolism of an isolated muscle, then make the animal thyrotoxic and determine the metabolism of the opposite corresponding muscle. This has not yet been done, so far as I know, so that the actual method by which the thyroid secretion stimulates metabolism is not yet known.

The acute effects of a thyroid preparation on the isolated heart were studied by Richardson,[22] and later by Kakehi [22] in Asher's laboratory. They could see no prompt effect from the presence of the thyroid alone on either the amplitude or the rate of the heart beat, but they did not study the metabolism. It is probable that no immediate effect would be elicited, however, because of the latent period in the metabolic action of the thyroid. Therefore, the theory of the general action of thyroxin directly on cells still needs an experimental basis. We have, however, been able to study the metabolic effects of hyperthyroidism, particularly in regard to the rôles played by activity, tremor and muscle tonus.

Marie Krogh,[23] in a preliminary report published some years ago, suggested that muscle tonus might be the factor in the increased metabolism, and many have often thought, I am sure, that the stiking evidences of muscular activity might explain the high metabolism in thyroid disease. We studied animals rendered thyrotoxic by the injection of thyroxin. Their metabolism rose in a few days to a level usually more than 50 per cent. above their previous basal values. When urethane anesthesia was then induced, and the metabolic rate again determined, it was found that the level remained high in spite of the fact that there was no muscle tremor and no activity other than cardiorespiratory movements. If now the nerves to the limbs were cut, the possibility of any tonus arising from either myelinated or sympathetic nerves was practically eliminated. Even this procedure did not cause the metabolism to return to its original level. It is therefore quite clear that neither activity nor muscle tremors nor muscle tonus explains the high metabolism found in hyperthyroidism.

To show how fundamental are the metabolic effects of these two internal secretions, it is interesting to note, here, that they may still be found under urethane anesthesia, although the metabolic stimulation from caffein or amino-acids has then disappeared.[24] What the significance of this difference is, however, cannot be analyzed at present. And so we return to the conclusion, often suggested, that the effects of both epinephrin and thyroxin on the metabolism are probably similar to that of increasing the draft under a fire. This is fairly clearly established for epinephrin, but needs further evidence for the action of thyroxin. It is true that the evidence brought forward in this paper has related largely to the two active substances which have been isolated from the thyroid and the suprarenals. They probably have at least one more secretion: that derived from the suprarenal cortex. Extracts from it have had no acute effects on metabolism in our

20. Evans, C. L., and Ogawa, S.: The Effect of Adrenalin on the Gaseous Metabolism of the Isolated Mammalian Heart, J. Physiol. **47**: 446-459, 1914.

21. Martin, E. G., and Armitstead, R. B.: The Influence of Adrenalin on Metabolism in Isolated Skeletal Muscle, Am. J. Physiol. **59**: 37-43, 1922.

22. Richardson, H. B.: Beiträge zur Physiologie der Drüsen, XXIV, Wirkung innerer Sekrete, insbesondere von Schilddrüsensekret und Adrenalin, auf das überlebende Säugetierherz, Ztschr. f. Biol. **67**: 57-82, 1916. Kakehi, S.: Beiträge zur Physiologie der Drüsen, XXV, Fortgesetzte Untersuchungen über die Wirkungsweise von Schilddrüsensekret auf das überlebende Herz von normalen und schilddrüsenlosen Tieren, ibid. **67**: 104, 1916.

23. Krogh, Marie: The Influence of Thyroidin on Normal Metabolism, Ugesk. f. Læger **78**: 2337-2340, 1916.

24. Aub, J. C.; Everett, M. R., and Fine, J.: Unpublished data.

hands, and its function remains mysterious, although essential to life. Whether it, too, has a metabolic function remains to be proved.

CONCLUSIONS

1. Apparently, the two glands which most influence the total metabolism are the thyroid and the suprarenal (probably by epinephrin).
2. The mechanism of their actions are independent. Collected evidence shows that the calorigenetic action of thyroxin is manifest without the suprarenals; that of epinephrin is present without the thyroids.
3. The theory is advanced that the suprarenals exert acute effects, while the thyroid is the more sluggish regulator of the metabolic rate.
4. The method of action of thyroxin and epinephrin on the body tissues has been discussed.

HYPOFUNCTION AND HYPERFUNCTION OF THE DUCTLESS GLANDS *

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It is difficult, if not impossible, to present the subject of endocrine dysfunction in a brief article, without appearing to be both ignorant and dogmatic; ignorant of many alleged facts, because time does not permit giving the reasons for their rejection, and dogmatic because practically every statement made in regard to the ductless glands today requires qualification, which is, for the most part, ruled out by the time limit. Furthermore, I take part in this discussion with the diffidence of a man whose personal experience is limited largely to the experimental side of the subject. However, I have a fair acquaintance with the entire endocrine literature, in both the field of science and the field of fiction, and I take for granted that we all subscribe to the principle that the rules of evidence or criteria for facts are the same in the experimental and in the clinical fields.

HYPOFUNCTION

When the ductless glands are so situated that they can be surgically extirpated, in whole or in part, without injury to important adjacent organs, the extirpation of these glands in the healthy animal gives us the most reliable information regarding the results of hypofunction of each specific system. The hypofunction syndrome may be complex and may gradually involve endocrine organs other than those extirpated, but the initial cause can with certainty be referred to absence of the function normally carried out by the organ which has been removed. This ideal anatomic condition obtains in the case of the thyroids, the parathyroids, the pancreas, the thymus, the ovaries and the testes. In most animals, the cortex and medulla of the suprarenal glands are so closely fused that it is difficult to extirpate the one without grave injury to the other. This applies also to the two (or three) systems that make up the pituitary gland. Furthermore, the location of the pituitary and the pineal glands within the cranial cavity and close to the midbrain renders it difficult to extirpate these organs without injury to the base of the brain, and tumors or cysts in these glands practically always involve brain injury by pressure.

Extirpation experiments in healthy animals have thus established the following general facts:

Loss of the thyroid is followed by cretinism in the young and myxedema in the adult. But it should be noted that some of the myxedema symptoms following hypothyroidism in man are not readily produced even by complete thyroidectomy in the healthy adult animal.

Loss of the parathyroids induces depression, tetany and death in a few days, unless the animal is subjected to special dietary and diuretic control.

Loss of the pancreas leads to absolute diabetes and death from diabetes (in the dog) in from four to seven weeks.

Loss of the testes is followed by persistent sexual infantilism in the young, and in the adult by loss of the sex urge and sex functions, and by gradual atrophy of most of the secondary sex characters.

Loss of the ovaries results in persistent sex infantilism in the young and in premature menopause and gradual atrophy of most of the secondary sex characters in the adult.

Loss of the suprarenal medulla induces no symptoms and no disease, according to the most reliable observations.

Loss of the suprarenal cortex causes profound prostration and death within a few days, in what appears to be acute Addison's disease.

Loss of the posterior lobe of the pituitary gland appears to produce no definite symptoms. There are competent investigators claiming that this lesion induces diabetes insipidus and disturbance of metabolism, while equally good workers hold that diabetes insipidus is caused by injuries to the base of the brain outside the hypophysis. The question is not settled.

Loss of the anterior lobe of the pituitary gland appears to produce impairment of growth and infantilism in the young, and in the adult a tendency to adiposity and somnolence, with atrophy of the gonads and failure of sex functions. According to one group of investigators, complete extirpation of the anterior lobe leads to death, in profound depression, in a few days; while another group of equally competent men claim that such deaths are due, not to the loss of the gland, but to injury to the base of the brain. This question is open. But all workers are agreed that almost complete loss of the anterior lobe (including unavoidable injuries to the base of the brain) leads to hypopituitary infantilism, at least in a percentage of the animals so operated on.

Extirpation of the pineal gland causes no symptoms. The loss of the spleen or the duodenum is also without endocrine effects. Extirpation of the thymus produces no effect, except perhaps slight hastening of adolescence in the young.

Time does not permit a further analysis of the hypofunction syndromes just outlined. The hypothyroid and the hypopituitary syndromes are particularly difficult to evaluate or diagnose because of the variability of some of their major elements. We must, therefore, clearly recognize that while the terms cretinism, myxedema or hypopituitary infantilism are permissible and useful in relation to primary etiology, these terms cannot be used as formulas representing facts established, and hence as a certain basis for therapy. A cynical judge once asked, "What is truth?" but did not tarry for an answer. The question, What is hypothyroidism or hypopituitarism may be laughed out of

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court as "academic," or as already settled by this audience of "practical men"; but I raise it nevertheless as a challenge to those who would sacrifice honesty for short cuts to commercial success, and those who would practice the trade of the quack under the protecting cloak of membership in an honorable profession.

These extirpation experiments on healthy animals, from embryos to adults, permit the following generalizations:

1. Each system of ductless glands appears to be essentially identical in function in all classes of vertebrates. This fact renders it highly probable that corresponding glandular hypofunctions in man will induce similar syndromes. We know that this is the case in regard to the gonads, from the effects of gonadectomy in healthy men and women.

2. None of the ductless glands appear to work to full capacity under normal conditions, since from three quarters to seven eighths of each gland system may be removed in the healthy animal without producing any deficiency symptoms. This is a very disturbing factor in the clinical field when we attempt to relate the histopathology of the ductless glands to the patient's disease.

3. No matter what changes in the way of atrophy or hypertrophy may be induced in the remaining ductless glands on extirpation of any one gland system, the essential effects following distinct hypofunction of each gland system appears to be specific for that system. In other words, extirpation experiments on healthy animals afford little or no evidence of substitution or vicarious functioning by the ductless glands that remain in the animal.

4. The symptoms produced by the extirpation of the ductless glands in healthy animals can be interpreted either on the hormone theory or on the detoxication theory.

5. No chemical methods are at present available by which we can demonstrate the presence of hormones and their quantitative variations in the blood and tissues, or even in the glands themselves. The iodin in the thyroid appears to be somewhat of an index of the thyroid secretion. We can make iodin determinations of the blood, the lymph, and the other tissues of the body, but we cannot conclude that the iodin found represents thyroidin and this only. We have chemical tests for epinephrin, but epinephrin is probably not a hormone.

In regard to the possibility that some, if not all, of the ductless glands may work on the principle of detoxication, it is equally true that we have no chemical tests for the toxins in the blood and tissues that may be responsible for the hypofunction syndromes, except possibly in the case of the parathyroids. Recent work seems to demonstrate that the tetany and death following extirpation of the parathyroids are due to toxic protein derivatives produced by the action of the colon group of organisms on the animal proteins of the food. Some of these toxic protein derivatives can be chemically isolated. The foregoing facts may be stated positively by saying that, so far, the tests for hypofunction of the ductless glands are indirect or biologic.

6. The relative immunity of some individuals to complete or nearly complete extirpation of some of the ductless glands is usually explained by the age factor (the young being less immune) and by abberrant or accessory glandules. That accessory glandules of some of the systems frequently occur is well known, but we question the adequacy of these explanations for all the exceptions.

In the clinical field, results fairly comparable to those following extirpation of endocrine systems in healthy animals are produced by clearly destructive lesions in single gland systems. Such lesions as tuberculosis, cystic degeneration, fibrosis, or atrophy, when including all or nearly all of the glands, are practically equivalent to extirpation with the knife, provided the lesions are strictly localized. Such strict limitations of destructive lesions are rarely found in postmortems, especially in persons past from 30 to 40 years; but when they are established, we have what may be called frank hypofunction, and the etiology of the syndrome is just as clear as in total or partial extirpation of a one gland system in healthy animals. In this way, the combination of careful clinical observations and postmortem studies have proved that hypothyroidosis and athyroidosis lead to cretinism and myxedema; that total or nearly total destruction of the suprarenal cortex leads to Addison's disease and death; that sufficient cystic degeneration of the hypophysis is followed by infantilism, and that marked destruction of the pancreas induces diabetes. Castration and spaying produces the same effects in man as in experimental animals, with the additional factors of nervous disturbances of the menopause and, probably, in some males, purely subjective effects in the way of feelings of regret or melancholia.

There is no reliable evidence that hypofunction of the suprarenal medulla induces deficiency symptoms. The theory of "suprarenalemia" as a clinical entity or disease is an illustration of where mere logic may lead us, when the major premise is an error.

The foregoing clinical conditions may be designated as frank hypofunctions of the ductless glands; and when the gland lesions approach complete destruction or atrophy, diagnosis can usually be made with a fair degree of certainty. I make this statement with a good deal of hesitation, particularly in connection with the thyroid and the hypophysis. Most of us have accepted as demonstrated facts the view that the thyroid secretion has a direct stimulating action on the basal metabolism, and that increase or decrease of the thyroid secretion in the body can be demonstrated by changes in the metabolic rate, at least as early and as clearly as any of the other changes in body functions that are supposed to be due to quantitative changes in the thyroid secretion. But now come apparently reliable clinical reports to the effect that: (1) so-called hyperthyroidism or toxic goiter may be present with a normal metabolic rate, and (2) hypothyroidism or myxedema may be present and parallel with a high, a low or a normal basal metabolism. If these are facts, it is clear that the present basal conceptions of thyroid physiology must be revised. But first let us make sure that these new observations are really facts. And, in the meantime, let us be still more careful in the diagnosis of clinical hypothyroidism and hyperthyroidism.

If our foundation is so shaky in clinical cases of what appears to be frank hypofunction of the ductless glands, what can we expect in only slight degrees of hypofunction? Here we have no aid from the macroscopic and microscopic conditions or chemical analysis of the glands, as such conditions are chronic rather than speedily fatal; and even when the glands or part of a gland is available for study, the interpretation of the histologic findings is mostly conjecture.

The other serious difficulty in the recognition of slight degrees of endocrine hypofunction is the fact that, in the case of some of the endocrine systems, the hypofunction must be considerable before the syndrome becomes clearly specific. This applies particularly to most of the nervous manifestations of endocrine hypofunction. Slight nervous disorders, slight gastro-intestinal disorders, slight disorders of metabolism, slight disorders of the sex life, seem to be produced by conditions in which evidence for primary endocrine etiology is lacking.

ALLEGED ENDOCRINE HYPERFUNCTION

The question of endocrine hyperfunction is not of as great importance in medicine as that of hypofunction, in view of our present knowledge. Hyperfunction must, of course, be considered in connection with the alternative theory of dysfunction or toxic secretion. The question of hyperfunction has no meaning or application in glands that work by detoxication.

1. Spontaneous endocrine hyperfunction is unknown in experimental animals. Much work has been done in the attempt to produce experimental hyperthyroidism in animals by thyroid feeding. Large doses of thyroid extract produce some of the symptoms of toxic goiter, such as increased metabolism, tachycardia, emaciation and gastro-intestinal disturbances. The nervous and ocular manifestations of toxic goiter are not produced.

2. In man, endocrine hyperfunction is assumed by many people as a causative factor in:

(1) Toxic goiter (the thyroids); (2) acromegaly (the hypophysis, anterior lobe); (3) hypertension (the suprarenal medulla and the thyroids); (4) precocious puberty (the suprarenal cortex, the hypophysis and the pineal gland); (5) diabetes (the thyroid); (6) excessive sex urge (the gonads); (7) excessive menstruation (the ovaries or the corpus luteum).

Now, what are the facts? In the first place, mere increase in the size of glands, mere hyperplasia, does not mean more gland activity or more secretion. We have thyroid hyperplasia and thyroid adenomas without physiologic disturbances, yet the size, structure and chemistry of the thyroid appear identical to these facts in toxic goiter. Biologic and chemical tests of the blood at present are not delicate enough to detect the thyroid secretion or quantitative variations of the secretion. The colloid and iodin of the thyroid is usually reduced in toxic goiter, but this is also the case in thyroid hyperplasia associated with no toxic symptoms. Furthermore, the reduced quantity of iodin, thyroglobulin or thyroxin in the gland may mean that the gland is producing more secretion; it may also mean that the gland produces less secretion. It is a fact that excessive thyroid feeding induces in man some of the symptoms of toxic goiter. Apart from this, the results of medical and surgical management of toxic goiter can be equally well explained on the basis of a toxic or perverted secretion. This theory, moreover, is not inconsistent with the existence of myxedema and toxic goiter symptoms in one person at the same time. This condition is difficult, if not impossible, to explain on the theory of hypersecretion. The primary relation of exophthalmic goiter to the thyroid may not be cleared up until complete thyroidectomy is made in a well controlled series of patients having toxic goiter. I believe this can be done without harm to the patient, if one or two parathyroids are spared or the parathyroprival symptoms are controlled by diet and diuresis, and possible myxedema controlled by thyroid feeding. There are plenty of patients with toxic goiter showing little or no improvement on either surgical, roentgen-ray or medical therapy. Such patients would probably be better off with some myxedema than with severe exophthalmic goiter, and the medical profession would have taken a step forward through knowing with certainty the primary relation of the thyroid to toxic goiter.

We encounter similar difficulties in the relation of pituitary hyperplasias and tumors to acromegaly. We know for a fact that hypophysial adenomas or hyperplasias are associated with acromegaly, just as thyroid hyperplasias are associated with exophthalmic goiter. But the causal connection between the gland enlargement and the disease is obscured by the fact that we have hypophysial hyperplasias and tumors with acromegaly, and acromegaly without tumors of the hypophysis. Nothing resembling acromegaly has so far been produced experimentally by administration of hypophysial preparations. And the final difficulty is the condition of unilateral acromegaly, a fact that appears irreconcilable with the simple excess hormone theory of causation.

We may now ask whether any of the disorders of the sex life have been found to be due to hyperfunction of the gonads? If we could uncover the processes of life by logic alone, we might conclude that, since gonadectomy or frank gonad hypofunction decreases or abolishes nearly all manifestations of sex, excessive manifestation of the sex urge, of menstruation and of the nervous activities more or less specific for sex life are due to hyperfunction of the gonads. There is little or no support for such a conclusion from either the clinic or the laboratory. It is true that ovariectomy will stop menorrhagia, just as it will stop normal menstruation. Does that prove that menorrhagia is caused by ovarian hypersecretion? Not at all. The menstrual disturbance is just as readily explained by the action of qualitatively and quantitatively normal ovarian hormones on mechanism rendered hypersensitive by other factors. Given otherwise normal men and women, a hundred ovaries and a hundred testes instead of two would probably not increase the menstruation or the sex urge above the normal.

The question of toxic ovarian secretion has been raised in connection with osteomalacia. We have reports of cure of this malady by ovariectomy, also reports of failure of cure by ovariectomy. It is an open question. There is no evidence that the normal ovarian hormones have any special influence on the health of the bones.

The question of hyperfunction has also come up in connection with hyperplasia of the thymus, and with tumors of the pineal gland. Since extirpation of these glands produces no effect, it is difficult to conceive just how hyperactivity of the glands might cause disease, especially if the thymus gland works by the method of detoxication. Pineal tumors might cause far reaching effects by mechanical pressure on the midbrain.

ALLEGED HYPO-ACTIVITY AND HYPERACTIVITY OF THE DUCTLESS GLANDS THROUGH DISTURBANCE OF THE NERVOUS SYSTEM

We have the following possibilities: 1. The endocrine glands may be under complete control of secretory nerves, like the salivary and the lacrimal glands, in which case we would expect hypofunction and atrophy to follow denervation. 2. They may have no secretory

nerves, but may be controlled by the composition of the blood, as the kidneys are. In this case, the effect of denervation cannot be predicted. There may be hyperactivity, hypo-activity or no change in activity. 3. They may be controlled in part by secretory nerves, in part by the composition of the blood like the glands of the stomach. In this case also the effects of denervation might be zero These appear to be the facts:

1. Sectioning of all the nerves to the ductless glands produces no demonstrable effect on the body functions, and no significant changes in the glands. The suprarenal medulla seems to constitute an exception to the second part of this statement. Denervation of the suprarenals induces no disturbance of body functions, except in the output of epinephrin. This is decreased or completely stopped. This shows that the output of epinephrin is under the control of vasomotor or true secretory nerves. It also shows that epinephrin is of little or no importance as a hormone.

2. Vasomotor nerves appear to be present in all the endocrine glands, and by histologic methods nerve filaments have been traced to or in close proximity to the gland cells themselves. In some of the glands, notably the pancreas, numerous ganglion cells are present in the peripheral nerve net. The suprarenal medulla, the posterior lobe of the pituitary and the pineal glands are modified nervous tissues, and these glands may retain some of their original nervous connections.

3. What effects are produced by artificial stimulation of the nerves that go to the endocrine glands? Direct stimulation of the peripheral end of the splanchnic nerves augments the output of epinephrin, and ultimately exhausts the suprarenal medulla of epinephrin. The question of reflex and central control of this suprarenal nervous mechanism is unsettled. Competent investigators have reported absolutely contradictory results, and clinical opinions bearing on the question are mere guessing. This is the only securely established instance of nervous control of a possible endocrine gland, but the output controlled by the suprarenal nerves has yet to prove its right to be classed as a hormone.

The methods used in the attempts to demonstrate nervous control of the hypophysis have been shown to be unreliable. We have a mass of data, most of it contradictory, and the remainder not yet confirmed, on the nervous control of the thyroid activity. We may disregard the histologic reports and the alleged surgical cure of toxic goiter by section of the thyroid nerves (the cervical sympathetic). The change of iodin content of the gland on stimulation of the thyroid nerves is questioned, and even if such change should be conclusively established, the interpretation of the fact is uncertain. But there are two lines of experimental evidence that require serious attention. It seems to be a fact that stimulation of the thyroid nerves induces changes in the electrical potential in the gland (usually increased negativity but sometimes positivity). Similar experiments (pituitary injections) on the mammary glands have been reported as proving that pituitary extract causes secretion of milk. The electrical change following administration of pituitary extract is due to contraction of the smooth musculature of the mammary glands. Before the electrical variations in the thyroid gland on stimulation of the thyroid nerves can be accepted as proving the nervous control of thyroid activity, it must be shown that the electrical change is not induced by the contraction (or relaxation) of the arteries, capillaries and veins in the gland. It is further reported that stimulation of thyroid nerves and mechanical massage of the thyroid gland in cats under light ether anesthesia accelerates the denervated heart. Massage of the thyroids for two minutes is reported to accelerate the heart for from thirty to ninety minutes after a latent period of from fifteen to twenty minutes. The investigators state that the experiment does not succeed in the months of March and April. The experiment, when successful, is interpreted as showing that mechanical massage and nerve stimulation increase the output of the thyroid hormone, which in turn accelerates the heart indirectly by increasing the body metabolism. It is pointed out as supporting evidence that mechanical massage of the suprarenals increases the output of epinephrin. We may note as equally true that mechanical massage of the kidneys, the pancreas, and the salivary and gastric glands, does not stimulate these glands to increased activity. The failure of the experiment in March and April is puzzling, as no one has shown any seasonal variations in the thyroid hormone of the cat. If the cat's thyroids are shy of iodin in March and April, such deficiency can easily be remedied by feeding iodids. But the most serious difficulty in accepting the positive findings as evidence of nervous control of thyroid activity is the prompt appearance and rapid cessation of the cardiac acceleration, the whole reaction being over within one to two hours, while it appears that a single intravenous injection of large or small doses of Kendall's thyroxin (a product assumed to be pure thyroid hormone) is reported to have no effect on the metabolism during the first twelve to twenty-four hours; then the increase in basal metabolic rate begins, reaches its maximum increase in from three to seven days, and slowly subsides to normal in from three to six weeks. This, if true, is surely a different reaction from that described as following the massage of the thyroid or stimulation of the thyroid nerves.

The question of endocrine hypofunction and hyperfunction through direct nervous control is of great practical and theoretical importance. But despite the great amount of painstaking work in this field (and disregarding the still greater amount of speculation), it must be recognized that the entire question is an open one, except for the suprarenal medulla. Let us hope that the future will record better controlled observations and less speculation. But it seems to me that this statement is permissible: Endocrine secretory nerves, if present, play a minor or negligible rôle in the normal and pathologic activity of the glands, otherwise demonstrable disturbances should be produced by denervation of the glands. It should, of course, be recognized that extreme changes in nervous activity may induce endocrine hypofunction or hyperfunction indirectly or by way of the blood through changes in metabolism.

ENDOCRINE HYPOFUNCTION AND HYPERFUNCTION THROUGH MUTUAL STIMULATION OR INHIBITION OF DIFFERENT ENDOCRINE GLANDS

In this field appears the maximum of fiction and the minimum of established facts. The principal facts are these:

1. It appears that the ovaries and testes (at least in mammals) cannot develop or maintain their normal function in marked hypothyroidism or marked hypopituitarism.

2. Thyroidectomy and, in some species at least, gonadectomy induces some hyperplasia of the hypophysis.

3. Thyroid feeding in experimental animals over long periods appears to induce some hyperplasia of the suprarenals (and the hypophysis), but this has probably no direct endocrine significance, because the thyroid feeding causes at the same time hyperplasia of the heart, the liver, the spleen and the kidneys.

4. Hypertrophy of the parathyroids has been described in thyroidectomized tadpoles.

5. In some cases, tumors of the suprarenal cortex seem to hasten maturation of the gonads, and gonadectomy may be followed by hyperplasia of the suprarenal cortex.

6. Castration retards the involution of the thymus. This may mean that hormones from a mature gonad are directly or indirectly responsible for the post-adolescence involution of the thymus. It has no further endocrine significance, since evidence is lacking for any endocrine activity of the thymus itself.

7. It is reported that crushing the suprarenal cortex induces a temporary fever, and that the latter is aborted by thyroidectomy. Assuming this to be a fact, it might indicate a stimulating action of the suprarenal cortex on the thyroid, inasmuch as complete suprarenalectomy does not induce hyperpyrexia. But crushing the suprarenals is not a simple experiment, and we must await further work before the results can be clearly interpreted in the sense of mutual endocrine control. It may be noted in this connection that the feeding of suprarenal, that is, cortical residue or extract, is reported as a cure of toxic goiter. If toxic goiter means thyroid hyperactivity, this may indicate inhibitory action of the suprarenal cortex on the thyroid. But all of us know that the "cures" for mild cases of toxic goiter are legion, and severe cases may resist all available therapy, including rest and diet.

If the foregoing facts are restated in terms of endocrine interdependence, the situation is this: The failure of gonad function in hyperthyroidism is probably due to the profound distribution of metabolism. In cretinism and myxedema, there is evidence of degeneration or atrophic changes in most of the organs of the body. It is well known that depression of the gonads is a frequent effect of metabolic disturbances from faulty diets, as well as from chronic maladies resulting in cachexia. The failure of gonad function in frank hypopituitarism may also be due to the general impairment of growth and metabolism; but this is less certain, because the disturbance of metabolism in hypopituitarism appears to be less profound than in hypothyroidism. But we are not justified in interpreting the fact in the sense of a direct stimulation of the gonads by pituitary hormones, since pituitary feeding seems to have no influence on gonad development, and acromegaly itself may be accompanied by gonad depression rather than the reverse. The possible significance of the hyperplasia in some ductless glands following hypo-activity or hyperactivity in another gland system will be considered in a later section. At present, there is no evidence that hypo-activity or hyperactivity of any endocrine system, outside of the specific gland involved, can produce or prevent diabetes, myxedema, Addison's disease, infantilism or acromegaly. Despite this fact, the thyroid-pituitary-pancreas-suprarenal-gonad group will probably continue to be a favorite exercise ground for speculative physiology and therapy in regard to mutual hormone control.

THE QUESTION OF HYPERFUNCTION IN CASES OF GLANDULAR HYPERPLASIAS

There is a tendency among both laboratory workers and clinicians to interpret glandular hyperplasias, that is, increase in gland volume by increase in the number of apparently normal cells, as evidence of glandular hyperfunction. This interpretation is also applied to adenomatous hyperplasias, especially of the thyroid, the pituitary gland and the suprarenal cortex. We must recognize that on the anatomic and histologic basis alone this interpretation is a theory that may be 100 per cent. correct or 100 per cent. wrong. We have some reliable histologic criteria of the state of secretory rest and secretory exhaustion in the case of the digestive glands, and previous degrees of activity of the digestive glands can be inferred by the degree of depletion of so-called secretion granules; but it must be recognized that this correlation of histologic changes with the state of activity would have been purely theoretical even for the digestive glands, except for the fact that we have a direct measure of the activity of the digestive glands in the output of the digestive juices. As previously stated, we have no certain means of directly measuring the rate of output or concentration of the hormones in the blood, except epinephrin, and this is not an important hormone, if it belongs in that group at all. Hence, we are limited to attempts to correlate gland histology with body symptoms that may or may not be specific effects of hyperactivity or hypo-activity of the gland in question. We have microchemical tests for iron, glycogen, fat, etc., in the cells, but none for the hormones.

It appears that thyroid colloids can be stained inside the thyroid cells, but we do not know the relation of thyroid colloid in the cells or in the lumen of the gland to the rate of output of thyroid hormone. Diagnosis of toxic goiter from the structure of the thyroid or the thyroid adenoma alone is, at present, merely guesswork.

In the same way, variations in kinds and numbers of cells or granules in the cells in tumors and hyperplasias of the hypophysis, particularly if the studies are made on ordinary postmortem material, permit no conclusion as to hyperfunction. And the situation is scarcely better in regard to the relation of the pancreas to clinical diabetes. Postmortem examination reveals a high percentage of pancreatic lesions in persons having no diabetes. The hydropic degeneration of island cells usually found in the pancreas of diabetic patients is regarded by some as one of the *effects* of the diabetes. It is generally agreed that many cases of fatal diabetes could not have been diagnosed by the histology of the pancreas alone. It is probable that increase or decrease in some cell functions antedates structural changes in the cells as revealed by present methods.

In recent years, much attention has been given to the endocrine glands as related to various types of nervous disorders. The difficulties in this field are increased by the fact that we have as yet no reliable method of studying functional nervous disorders in animals under experimental interference with the ductless glands. By the law of chance, some endocrine disturbance will be present in a certain percentage of insane persons, even if there is no causal relationship between the two phenomena. The literature records a high percentage of what appears, microscopically, to be pathologic endocrine changes in necropsies of such patients. The significance of such pathologic

endocrine changes (mostly hypoplasia or atrophy), in the cause and course of the nervous disease, is most uncertain, especially when physical or physiologic signs of specific endocrine dysfunction are lacking. Such endocrine changes may have no more significance than the high percentage of destruction in the pancreas in persons past middle life, dying from diseases other than diabetes.

We have examples of endocrine therapy in nervous disorders that display the courage of ignorance. I do not know what you think of suprarenalectomy as a cure for idiopathic epilepsy, but for the present I would leave the suprarenals alone and operate on the patient's pocketbook by some other route.

Has, then, the microscope ceased to be a useful tool in biologic investigation? On the contrary, let the tribe of microbiologists increase. But I plead for greater discernment in the physiologic interpretations of microscopic findings.

THE EVIDENCE FOR ENDOCRINE HYPOFUNCTION AND HYPERFUNCTION FROM THE FIELD OF ORGANOTHERAPY

Except for the condition of hypothyroidism, the extensive literature on clinical and experimental organotherapy has so far yielded little or nothing conclusive touching endocrine dysfunctions. This should cause no surprise. Organotherapy can have no effect in maladies due to dysfunction of ductless glands that function on the principle of detoxication. And in the case of glands that function by producing hormones, organotherapy may fail now and forever, (1) if the hormones are not stored up in the gland; (2) if they are too unstable for the necessary chemical processes of isolation for intravenous or hypodermic administration, or (3) if, on oral administration, they are destroyed in the processes of digestion and absorption.

With the exception of the thyroid hormone, and the drugs epinephrin and pituitary extracts, we literally do not know what we are feeding when hypophysis, suprarenal, testes, ovaries, pancreas or parathyroid preparations are administered to patients. Moreover, the specific endocrine factor in the malady in which organotherapy is tried is often a matter of conjecture. That is to say, we are administering "unknowns" to cure diseases of unknown origin.

Organotherapy has been tried in literally every disease known to man. Except for the thyroid, the results are so conflicting that they seem to depend, not on drugs, but on the physician who prescribes them. Fifteen years ago, Pohl's spermin or testicle extract was a cure-all in Russia; today, pluriglandular proprietaries are doing even greater wonders in our country, according to the testimonials. Let us keep a few things clearly in mind in this connection:

1. So far, it has not been possible by organotherapy to appreciably influence the impaired functions due to gonadectomy, ovariectomy, parathyroidectomy, pancreatectomy[1] or hypophysectomy in animals. In these cases, we know at least the initial pathology, even if we do not know what we are feeding in the gland extracts.

2. The history of medicine and of quackery teaches honest men to be slow in ascribing specific values to any therapeutic measure that seems to improve subjective symptoms, or to cure in the field of the functional nervous diseases.

3. The trial-and-error method, or empiric organotherapy, is a legitimate path to follow. But I think you will agree with me that it is not a path of progress when the trials are so made that nothing but error can result from them. The trial frequently consists in: improved diet, rest, and gland extracts; the error is the conclusion that the gland extract is responsible for the improvement of the patient. Let us not forget that thyroid administration, even in frank hypothyroidism, is in many cases not a complete substitute for the normal thyroid. And thyroid therapy is our best, if not our only case.

It is scarcely necessary to refer to the ease and assurance with which alleged endocrine disorders are diagnosed and treated with gland extracts by men of good standing in the medical profession. Some aspects of the literature on glandular extract therapy today remind one of the age of demonology in medicine. Following are four typical citations, not from Alexander Dowie, Louis Berman or Mary Baker Eddy, but from our respectable medical journals:

> Clinical studies have proved that certain physiologic and structural markings are constant to certain glandular types, and by physical objective examination alone without other information we can make an accurate diagnosis.
>
> The alert, aggressive attitude of the healthy young man, and the similar, though feminized, pose of the healthy young woman, are in large part an evidence of thyroid activity. The tremors, and blushes, the sentiment of the young woman, the nervous apprehension of the young man under emotional stimulation are also largely evidences of thyroid activity. The blushing of the sensitive young girl or boy is but a neurocirculatory reflex exaggerated by thyroid overactivity into the neurocirculatory instability of the definitely hyperthyroid patient.
>
> Periods of great emotional output, such as courtship, early months of marriage, and the more active phases of an artist's career, are accompanied by enlargement of the thyroid.
>
> There is also something closely allied to a diminished action of the thyroid gland that renders the old maid less generous and less spiritually beautiful than the pregnant woman.

EVIDENCE OF ENDOCRINE HYPOFUNCTION AND HYPERFUNCTION FROM THE FIELD OF ROENTGEN-RAY THERAPY

The destructive action of the radium and the roentgen rays on tissues is well established; and it is well known that atrophy and hypofunction of such organs as the thyroid, the ovaries and the testes can be induced by these agencies. On the theory that doses of roentgen rays, too slight to destroy, will stimulate and thus increase the normal functions of glands, the pancreas has been roentgen rayed in diabetes; the hypophysis, in Fröhlich's syndrome, etc. Positive results have been reported, despite the fact that careful experiments on glands, where the activity can be measured with quantitative and qualitative accuracy, have shown only destructive actions by the roentgen ray. An almost miraculous result is reported in the case of a 15 year old boy with some Fröhlich's syndrome signs. "After four roentgen-ray irradiations of the hypophysial region, the penis grew 8.5 cm. in three months." Evidently, we are witnessing the beginning of a race between roentgenologists and surgeons as harbingers of virilism.

The possible stimulating action of radiant energy on the ductless glands should be tried, but tried under conditions that permit the evaluation of the results. At present, we do not possess any certain means of

1. Work in progress at the University of Toronto seems to promise more positive results from the pancreas hormone in experimental diabetes.

stimulating any ductless gland, "gently" or otherwise, except possibly through the food, and this is probably not specific. Those who speak with such ease and assurance of "stimulating" this, that or the other endocrine gland are merely giving a demonstration of their ignorance.

THE ETIOLOGY OF ENDOCRINE APLASIA AND HYPERPLASIA IN MAN

Destructive lesions of the endocrine glands, such as tumors, tuberculosis, cystic degeneration and fibrosis, are not peculiar to these organs, and consideration of the etiology of these lesions would take us too far afield.

Factors that may be primary in other aplasias and hyperplasias are: heredity, undernutrition, intoxication from deranged metabolism (qualitative and quantitative) and infections (specific and general).

The possible hereditary factors have not yet been seriously investigated.

Some of the ductless glands appear to be readily disturbed by undernutrition, or unbalanced diets. It is fairly certain that some iodin in the food is necessary for the normal activity of the thyroids. There is considerable literature pointing toward infection as the primary factor in certain types of thyroid hyperplasia. But the question is still open. It is possible that endocrine aplasias and hyperplasias are induced by a variety of factors. Research in this important and difficult field is being neglected in comparison with the amount of attention devoted to the less difficult and more spectacular (and remunerative) administration of gland products.

CONCLUSION

No single phase of endocrine dysfunction is satisfactorily worked out today, either clinically or experimentally. I have endeavored to present the established facts and what appear to be obstacles to progress in baseless speculations and uncritical practice. I am not foolish enough to believe that the former is free from flaws, and some of you may feel that my strictures on the latter are too severe, especially coming from an experimental physiologist. But I have not spoken as a pharisee or as a mere arm-chair iconoclast. The credit for progress made and the blame for errors committed are shared by the clinical and laboratory groups. I leave out of consideration the hopelessly ignorant and the actually dishonest who, no matter what their position and training, belong to the genus *quack*. One sure way of inviting defeat is to underestimate the resourcefulness of the enemy. Failure to recognize the complexity of every endocrine problem is an equally serious obstacle to victory. In following the hormone theory alone, we may, in the case of some of the ductless glands, even be way off the main road.

I believe that much of the glandular therapy of today, however harmless to the patient, injures the good name of the medical profession with intelligent laymen. We cannot practice quack methods and escape the just censure of society.

The quack diagnoses every ailment with ease, and offers remedies for every disease with assurance. The good physician knows that he is neither omniscient nor omnipotent in the field of disease; and the educated layman knows this as well as the physician. Then, why pretend? Bluff may succeed for a time, but honesty is better for society; and what is best for society is best for the medical profession. It is related, in the most ancient medical record now known, the Smith Papyrus, that the good physician in Egypt 5,000 years ago practiced medicine with the same honesty and the same quality of intelligence as that of the good physician of today. When physicians of that age knew, or thought they knew, that no available remedy would help the patient, they did nothing, while the quack worked his "cures" with the hookums of that age.

SOME PRINCIPLES OF ENDOCRINOLOGY APPLICABLE TO ORGANOTHERAPY*

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In a field of biology the bibliography of which runs to 500 pages, the need for the formulation of principles might be expected long since to have passed.[1] To any one conversant, however, with the endocrine literature, it is obvious that no general agreement on principles—and hence on practice—has yet been reached.

Endocrinology is to an unusual degree an empiric field. Our fundamental conceptions have been attained largely by clinical observations of end-results rather than by rational induction from basic facts determined, after the approved fashion, by controlled experimentation. Empiricism has deserved much of the odium that it carries. That it has a legitimate place in medicine, however, is tacitly conceded by every one who prescribes any medicament the pharmacology of which is not fully known. Indeed, it has often been said that the value of any procedure in medicine must finally be determined empirically in the crucible of the clinic. The figure is apt; but let us recognize that a crucible is not an open hearth into which junk may promiscuously be thrown, nor is the result of a crucible test determined by the amount of smoke and spluttering produced. The only empiricism that is of value is that which results in well substantiated facts. When these facts can be adequately systematized they become science; but as facts, they are no more true than they were before.

Much of the existing confusion in the endocrine field would appear to be due to overanxiety to escape the reproach of empiricism—to force rationalization when no genuine rationalization is possible. In such attempts, one class of writers habitually misuses the form of inductive logic, selecting from the vast accumulation of data such as appeal to them, and ignoring such as are inconvenient. Thus, their basic "principles" are derived. Any writer adopting this method has no grounds for complaint that his dishonesty in dealing with the data of others leads to the conviction that he is equally dishonest in dealing with his own. The device of attempting to escape the necessity of patience and thoroughness by dubious theorizing should be discarded. It has brought contempt upon much that passes as endocrine literature.

ENDOCRINE ORGANS AND THEIR FUNCTIONS

So far are we from accepted principles that it is not amiss, even at this late day, to inquire, What is an

* Read before the joint meeting of the Section on Practice of Medicine, the Section on Pharmacology and Therapeutics, and the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. The bibliography of the fourth edition of Biedl's Innere Sekretion comprises 474 pages, and many articles have appeared since the published list was completed.

endocrine organ? Gley has formulated three determining conditions. The gland must show the histologic picture and the cytologic polarity of a secreting structure. This principle at once excludes from the endocrine congeries the thymus gland and the neural lobe of the hypophysis; but these in many circles are still in good and regular standing. A second principle is that from the organ in question an active substance must be obtained. Such a substance may be, but probably is not, a hormone. Final logical proof demands that the peculiar principle be detected in the effluent blood or lymph. In case of nearly all the assumed endocrine structures, this last step remains yet to be taken.

It is widely assumed that perturbed function in any one gland is characteristically followed by changes in others. It is presumed that any endocrine gland may show a condition of normality, hyperfunction, hypofunction, dysfunction, dysfunction plus hypofunction, or dysfunction plus hyperfunction; that is, one normal and five abnormal states. Theoretically there exist, therefore, five uniglandular syndromes for each endocrine organ. The more enthusiastic endocrinologists assert the existence of at least nine endocrine organs, each of which presumably can assume any one of the six states. The possible number of basic combinations, then, is six to the ninth power, or 10,077,696. One of these combinations is normality of all glands; hence the theoretical number of endocrinopathies is 10,077,695. If one is more modest and assumes the existence of only six glands, there are but a paltry 46,655 possible endocrinopathies.[2] To what extent these may be modified by relationships of vicarious function, interstimulation and interinhibition of varying degrees, one cannot offer even an intelligent guess. In any case, however, few of the theoretically possible endocrinopathies have ever been recognized clinically, and of these, still fewer have been reproduced experimentally. When each factor in each syndrome can be recognized and appraised, clinical endocrinology will have become a science. By that time even medicine as a whole may conceivably have become a science.

SOURCE AND VALUE OF GLANDULAR PRODUCTS

Perhaps the most interesting immediate question to the practical endocrine therapist is, From what glands can active hormone products be derived? Judged by the "therapeutic test" in the hands of credulous impressionists, the number is extensive. The number for which there is adequate proof is much smaller. The proverbial "crucible" is still spluttering. The most convincing evidence on this point is being obtained by investigators on tadpoles. Seemingly, a healthy tadpole is vastly different from a sick woman. Practically, the tadpole is a very delicate physicochemical indicator of the operation of factors that modify vital processes; and the determination of such factors is the primary problem of the endocrinologist.

As to the clinical value of glandular products now available, much uncertainty exists. There is great need of standardization of methods of manufacture and of assaying. Even granted an endocrine function for a given gland, the quantity of hormone present at any one time may be very minute. Moreover, even if it exists in relatively large quantities in the fresh gland, there is no certainty that it will not all be lost in the manufacture of gland products. Furthermore, we know little as to the extent to which hormones are absorbed or destroyed in the alimentary tract. It would seem wise for the present for the individual observer in practical work to adopt some one preparation of each gland and use that exclusively for considerable periods. This would help to eliminate one of the variables that render the therapeutic literature so difficult to evaluate. It would also be desirable, until the actual value of each product is determined, to use fresh gland substance; but this is usually impracticable. It would be practicable, however, to obtain, in many cases, desiccated material that has not been subjected to any process of extraction or chemical treatment. From the standpoint of the pharmaceutical manufacturer, such a suggestion is not attractive; but a large body of evidence regarding the efficacy of the unaltered gland substance is needed as a basis from which to determine the relative value of special products. The ideal state will, of course, be reached when each active principle has been isolated and synthesized. If organotherapy ever takes the place that its more enthusiastic proponents prophesy, the available supply of natural products will be vastly inadequate. It is said, for instance, to require 5,000 calves to produce a pound of desiccated pineal substance.

REACTIONS

Another question of major importance has scarcely as yet been even considered, namely, What conditions modify the reactions to any given hormone? In case of epinephrin, it has been shown that the vasomotor reactions are diametrically opposite, depending on initial blood pressure, bodily vitality and temperature, dosage, reaction of the menstruum, and depth of anesthesia. In case of the thyroid there is evidence that change of dosage may reverse the reaction from anabolic to catabolic. Pituitary extract causes or checks diuresis, depending on attendant conditions. It is not unlikely that similar reversals of reaction will be found in the case of other gland products.

In the case of products that influence growth, the normal occurrence of proliferative cycles is of considerable importance. A given hormone might materially influence developmental processes at one time and be quite without influence at another.

A principle worthy of particular stress is that a given endocrinopathy may be readily amenable to treatment in its earlier stages, but quite intractable, later. Skeletal growth, for example, can no longer be influenced after closure of the epiphyseal junctures. Early diagnosis and early treatment are therefore of the utmost importance.

OBJECT OF ORGANOTHERAPY

Endocrine products may be prescribed with several purposes in view. The most definite is merely to compensate additively for a deficient hormone. Thyroid gland is thus administered for myxedema. The possibilities of even this type of therapy, however, remain yet largely to be determined. Hallion has suggested that gland products often act by stimulating the homologous gland. This statement has been accepted by some writers as a biologic law. There is some definite evidence in its support, but the extent of its applicability remains for future determination. As to the usefulness of gland products to inhibit antagonistic glands, we have little significant information. Desiccated pancreas is said to depress the activity of the suprarenal glands, but what is apparently meant is that it is a slowly acting vasodepressant. If it be such,

2. I am indebted to my colleague Prof. W. M. Barrows for this mathematical formulation of the situation.

the substance may be of practical value; but there is little rational basis for regarding it as a suprarenal antagonist.

The use of endocrine products for their purely nonspecific pharmacologic properties offers a promising field for further investigation. The use of epinephrin and pituitary extract has been especially stressed. As regards pituitary extract, the prevailing opinion of recent years has tended toward conservatism. There are even extremists who would banish it from the field of obstetrics on the ground that the reactivity of patients varies so widely as to render it always potentially dangerous. The sublingual administration of the drug, however, would seem largely to eliminate danger and to widen materially the indications for its use in any condition wherein a general smooth muscle stimulant is indicated. Another promising field for therapeutic investigation is the utility of thyroid as a nonspecific drug. The thyroid hormone appears to be a general cell stimulant, and hence to be widely indicated in conditions in which depressed functional activity is a predominant feature.

DOSAGE

One of the most troublesome problems in organotherapy is that of dosage. In addition to variability of products, the variability of patients is striking. In current practice a given substance may be administered in quantities varying from a fraction of a grain to a hundred grains. In case of the thyroid, basal metabolism affords a control. It has been suggested that the dosage of desiccated hypophysis can be determined by the administration of increasing amounts to the point of producing headache, and then dropping to about half of this dosage. Empirically, it seems to be fairly clear that alternate periods of administration and of rest give best results.

At present there is much difference of opinion as to whether endocrine products should be prescribed singly or in combination. Looking to the interest of humanity at large, present and future, single products should be employed whenever there is a reasonable chance of their proving helpful. In this way only can we hope within any reasonable time to determine the independent value of each product. Whatever be the intricacy of organ involvement in the various endocrinopathies, it is to be supposed that ordinarily some one gland is primarily at fault. Biedl has stressed the fact that, with correct diagnosis on this point, uniglandular therapy may give brilliant results.

On *a priori* grounds, however, if endocrine syndromes are, as many maintain, always, or even commonly, pluriglandular, more rapid amelioration might be expected if a suitable pluriglandular formula were used. Practically, rational pluriglandular therapy would seem to demand a large number of different combinations, and these in differing proportions in each case, as indicated by the degree of involvement of each gland and the susceptibility of the patient.

It has been suggested that the free use of pluriglandular formulas is desirable on the supposition that the body cells will select those hormones needed and discard the rest. This theory apparently embodies a half truth. That the various body cells do select from the blood stream the substances necessary for their metabolism is obvious: the sphenoid bone and the vermiform appendix are fashioned from the same pabulum. That the body cells are able to reject any hormone, however, I know of no evidence; whereas, it is known that hormones are often assimulated by body cells to their own detriment or even death. In any unanalyzed syndrome, it would seem that a random hormone would be potentially harmful to the same extent that it would be potentially helpful.

CONCLUSION

It seems desirable again to emphasize the complicated nature of the problems with which the endocrine therapeutist is confronted. Little is to be expected from nonchalant attempts to solve these problems by superficial observations. Nor can a thoughtful clinician take seriously the claim that overenthusiastic use of gland products is to the best interest of the patient. The arguments adduced are precisely the stock arguments of the cultists and nostrum venders. Ultimately, practical organotherapy will have to be reduced to a statistical basis. This will require the accumulation of a much greater fund of well established observations, both positive and negative. There is need for many more careful studies of individual cases as well as extensive series of cases. Almost any endocrine case presents a research problem worthy of exacting study.

Individual endeavor by volunteer investigators is making some headway, but progress is necessarily slow. There is need for the founding of one or more well equipped and well financed institutions devoted specifically and in a large way to endocrine research. Such an institution should include a hospital with personnel and equipment for bringing to bear the best modern diagnostic and therapeutic technic, and especially for careful metabolic studies. In association with this hospital there should be provided adequate facilities for coordinated animal experimentation.

Endocrinology in some form is going to flourish indefinitely. Parlor endocrinology is even displacing parlor Freudism. For better or for worse, endocrinology has acquired a recognized place in the field of medicine. For two decades practitioners have been avidly seeking enlightenment regarding the practical, everyday problems with which they are confronted. As to how their needs have been met, let the present state of organotherapy testify. The problems offered are such as to tax the best efforts of the best trained therapeutists. Shall these gather their robes about them and pass by on the other side? To the extent that enlightened, critical leadership fails, to that extent will cheap, commercialized endocrinology have a large following, and medicine be cheapened to the same degree.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BARKER, CANNON, AUB, CARLSON AND HOSKINS

DR. WILLIAM ENGELBACH, St. Louis: As a whole, the symposium impresses one with the hypercriticism of those men who are seriously taking up the study of internal secretions. It gives a good general perspective of the relative importance of the internal secretions. The disorders of the ductless glands are only a small part of internal medicine, but this small, yet important, field has been greatly neglected. The most dangerous thing that confronts clinicians is the early misinterpretation of pathologic endocrine signs present in many normal persons. We each belong to a certain endocrine type, and we have to go farther than the establishing of a type picture to make a diagnosis of a ductless gland disorder. For instance, if a person has headache and he happens to be of the acromegalic type, it does not follow that the headache is of hypophysial origin. There has to be more evidence of pituitary disorder before that relation can be proved. The relation of the sympathetic nervous system to the ductless glands and the body as a whole must be given

more consideration. As pointed out by Dr. Cannon, the clinical experiments on vagotonia have been of value in excluding the positive basis on which this complex was introduced. I regret that Dr. Aub did not say more about those peculiar adiposities related to pituitary disease with a low basal metabolic rate. The most recent literature credits the pituitary gland with diminishing metabolism. As that metabolic rate is taken today, based on the oxygen exchange in the lungs, comparatively all these patients having pituitary adiposity experience no change in their basal metabolic rate, yet they gain weight rapidly. It will be necessary to have other tests—fat metabolism must be investigated, with other estimations of metabolism before this is explained. The cooperation of the best men in their various experimental departments will promote a better understanding of this complex subject. Dr. Hoskins' paper is timely in that it draws attention to the varied terminology and nomenclature prevalent at this time. Terms such as dystrophy and dyspituitarism, used as a cloak for ignorance, should be abandoned. The physiologists have not proved that we have a specific substance from some of these glands. There is no question that there is overenthusiasm in the treatment of ductless gland disorders. Undoubtedly, we can accomplish more by uniglandular treatment, even if we have a pluriglandular disorder. Make the test with one gland substance for a long time to determine whether you get a therapeutic reaction, and then, if you think there is another gland involved, give the other substance singly, noting results. Stock prescriptions of pluriglandular substances are difficult to control or estimate. For instance, a preparation containing one-half grain of thyroid, combined with epinephrin and spermin, given to a person who needs 5 grains of thyroid substance would be insufficient to meet indications. We have to know how to give each glandular substance up to the physiologic effect, and this varies in each individual patient.

DR. LEONARD G. ROWNTREE, Rochester, Minn.: Endocrinology is still young. It is far from a science. Facts are being pried from nature, and these facts are being scrutinized, systematized and correlated. Science will eventually evolve. The need in endocrinology today is, as it always has been, well planned and carefully executed clinical and experimental investigations, accompanied by analytic and critical judgment. Dr. Cannon has dealt largely with matters pertaining to the control of the activity of the endocrine glands, considerations which led Bayliss and Starling years ago to the discovery of hormones. To this field, Dr. Cannon himself has contributed much. He demands facts and not speculation, and it was extremely interesting to hear him say that he hints at correlation of function, but needs more evidence before accepting these correlations. Dr. Aub reports the results of studies where, happily, objective control is possible. He has furnished a model in the differentiation of facts from hypotheses and theories and he has made contributions to our knowledge of the factors involved in the control of metabolism and the mechanism involved in this control. Dr. Carlson has directed a searching inquiry into many of our physiologic and clinical beliefs, and has emphasized particularly the shortcomings of clinicians and also of physiologists. As a physiologist, he has subjected to critical judgment our claims concerning the qualitative and quantitative changes resulting from manipulative procedures or from processes of disease. He has attempted correlations of clinical, physiologic and pathologic data which, in part, have puzzled and baffled clinicians and which apparently are also somewhat puzzling and baffling to him. Dr. Hoskins has emphasized the magnitude of the therapeutic problem and has called on the leaders of the profession to exercise leadership in therapy as well as in diagnosis. There are certain needs in endocrinology: (1) postulates in endocrinology analogous to Koch's postulates in bacteriology; (2) a common basis among workers in the same field, and between workers in the various fields concerned in endocrinology, from the standpoint, first, of a common point of view, and, second, of nomenclature (Does hyperplasia, for instance, mean the same thing to all workers in all fields? Does it mean the same to all pathologists?); (3) clinical classifications and (4) objective control of therapy, such as we have in basal metabolism, urine output under the action of posterior lobe of the pituitary and blood pressure in Addison's disease. Progress in endocrinology will come slowly through thoroughly correlated, adequately controlled investigations, in which the findings are subjected to interpretation based on analytic and critical judgment.

DR. WALTER M. BOOTHBY, Rochester, Minn.: In a myxedematous patient, 10 mg. of thyroxin, injected intravenously, elevates the basal metabolic rate on the average 28 points. The height of the curve comes from the fifth to the tenth day after injection; it remains at this level for several days, and then gradually declines, reaching the original level from fifty to sixty days later. In the clinical administration of thyroxin or thyroid extract this delayed and long continued action of thyroxin must be taken into account in the determination of the size of the dose; also the fact that any change in the dose will not produce its main effect for five or ten days. Failure to appreciate this delayed effect has made it difficult to regulate properly the amount of thyroid extract required, and has led to the custom of intermittent administration. It is better, however, to establish a correct dose that can be given indefinitely; and it has been found that 1.6 mg. of thyroxin is usually the correct daily dose. The curve of the calorigenic effect of epinephrin is similar in form to that of thyroxin, provided that the time element is changed to minutes in the former case from that of days for thyroxin. In confirmation of Dr. Aub's work, we have been able to show in dogs that it is possible to obtain a calorigenic effect from such doses of epinephrin as Cannon and Stewart and Rogoff have shown to be within the powers of the suprarenal glands to secrete.

DR. H. T. HYMAN, New York: I was glad that Dr. Cannon called attention to the work that renders untenable the tonicity theory of the regulation of the involuntary nervous system. Dr. Cannon presented again his emergency theory and the evidence favoring it, but did not refer to the work at Western Reserve University which refutes many of the experiments on which the theory rests. With reference to the nervous influences on the thyroid, two facts are contrary to the evidence on which the supposition rests: 1. Thyroxin effects do not occur for hours, even days, after injection, while the supposed increased output of thyroxin following nerve stimulation is manifested in a few moments in the experiments quoted. 2. The supposed effect of the increased thyroxin output in the experiments of Levy we have produced weeks after thyroidectomy and have shown to be due to changes in the involuntary nervous system. We are indebted to Drs. Carlson and Hoskins for their interpretation of clinical results. We know that it is necessary to ablate about 90 per cent. of a gland in order to produce evidences of insufficiency in the laboratory; that even with a fragment of active glandular tissue remaining, normal function is maintained. Under these circumstances, where is the evidence for the much discussed formes frustes? So far as we know, no gland can function for another. Where, then, are the evidences for vicarious functioning? How can endocrinologists refer to results following endocrine therapy as "specific results" when we have no means of assaying glandular preparations and when we know nothing of the absorption? We speak of hyperfunction. When we are unaware of the output into the veins of the glands under normal conditions, how can we postulate a hyperfunction? Most of the symptoms attributed to disturbance of the ductless glands can be produced only through the involuntary nervous system. Consequently, no more important step in our knowledge must be sought than the mechanism by which the ductless glands affect the involuntary nervous system.

DR. WALTER TIMME, New York: Dr. Hoskins' mathematics are very simple algebra—on the basis of permutations and computations. As a matter of fact, that principle of mathematics depends on constant quantities. The endocrine system has no constant quantities, only variables, and that needs a higher type of mathematics—a calculus which furnishes information about differentials—but the end-result has to be integrated by integral calculus. So we are still further along than we were before and at the same time more deeply involved. The answer to any integral calculus problem dealing with variables is never one term or absolute quantity. It is always represented in a series of terms combined in a formula of functions of the factors involved. To illustrate: A middle aged woman gives the clinical aspects of myxedema.

her basal metabolic rate was determined by three investigations made by two investigators, and varied from plus 80 per per cent. to plus 100 per cent. Hence, the men who saw her refused to believe it was myxedema and refused to give her thyroid. Examining the case further, we found that she had intense headache, and roentgenographic examination showed she had an enlarged sella turcica and a bitemporal hemianopsia with a diminution of vision. Therefore, it was a case of hypophysial mass, plus myxedema. She was given small doses of thyroid. Within two or three days she began to improve; her headaches began to diminish in severity, and the basal metabolic rate became lower, on no other treatment than the administration of thyroid! It does not mean that the deficiency of the thyroid produced a high metabolic rate; that the hypophysial mass produced the high metabolic rate; the high rate may be due to pressure of the hypophysial mass on parts of the brain. In any event, it means that the integration of the syndrome is a formula, and that is what we have to consider in all the innumerable problems which confront us, and the formula is one which involves all the varying activities of the glandular elements.

DR. A. S. BLUMGARTEN, New York: I can discuss the subject only from its clinical aspect, and there are two phases to that: one is the importance of endocrine study in clinical medicine, and the other is the question of therapy. The study of the patient from an endocrine point of view is a valuable adjunct to the ordinary routine physical examination, especially when it is impossible to recognize a pathologic change by present methods of examination. Clinically, endocrine disturbances that are presented for treatment are usually disturbances in growth and development, and in physiology. In the majority of instances, the disturbances in development are not amenable to treatment by organotherapy, although the endocrine basis for the condition is apparent. The dried extracts of various ductless glands have a limited value, but it is hoped that we shall be able to get better results when we can better recognize the conditions amenable to treatment and have products which can give definite reliable effects. The basis of organotherapy is substitution therapy. One must be guarded, however, in drawing conclusions, as frequently spontaneous cures and improvements take place. For example: In the Froelich syndrome of pituitary disturbance, the improvement in genital development following pituitary therapy is often not the result of therapy at all. Many of the genital symptoms are merely a retarded puberty, which gets well spontaneously, even without therapy. The dosage is another important point in organotherapy. Since we are supplying a deficient substance and we have no way of determining the quantitative deficiency, we have no way of determining the dosage. I think we can summarize the present status of organotherapy in reference to dried extracts by stating that thyroid extract is curative in cases of thyroid deficiency, such as myxedema and cretinism. Pituitary extracts are valuable in relieving many of the symptoms of pituitary deficiency, largely of a subjective nature; and more valuable in females than in males. Objective results with pituitary extracts are rather rare. The other dried extracts are still in the experimental stage. Epinephrin and pituitary extract are useful for the production of their specific pharmacologic effects. The problem of the future consists in recognizing specific states of glandular deficiency and obtaining preparations that will produce definite results.

DR. HARRY A. BAKER, Minneapolis: There is a gland of which no mention has ever been made, important in the arrangement and, etiologically, a factor in the derangement of this system, i. e., the brain. Indeed, the brain ought to be included among the endocrines, for though, perhaps, through its subsidiary glands it is occupied in other activities, its chief function is the assimilation of matters sensate into sense and understanding. By regarding the brain as the head and front, and the sympathetic nervous system as the equilibrator, it then becomes easy to comprehend how disturbances primarily of the head result in functional derangements, faulty equilibration in metabolic disorders, and the reverse, faulty equilibration continued over a long period of time, resulting in minor or even grave functional disturbances, the relationship being almost as close as the cardiorenal to the organic system.

DR. LOUIS B. WILSON, Rochester, Minn.: In this congeries of clinicians, physiologists, biochemists and mathematicians I, an old time pathologist and morphologist, feel like one of the slow going high wheeled ox carts of my adopted state in a flock of aeroplanes. But I wish to say one word of suggestion to the aeronauts: Keep close to the ground when you start, remembering that almost all that we know of the actual facts of disease has been learned at the necropsy table. Let us not forget that there is, after all, something in morphology which we cannot ignore in our experimental or physiologic or biochemical work on disease. One of the essayists doubted somewhat the correlation of the morphologic evidence of increased activity in the thyroid in relation to hyperthyroidism, because there is an occasional instance in which hypertrophy and hyperplasia of the cells of the thyroid are not coincident with what the clinician says as they appear in the patient. Clinical evidence, you know, is not always absolutely true. Neither is experimental evidence always true. I do not find absolute agreement in the pathology and in the diagnoses that have been made. There is just a suspicion that the patient did not have what the eminent clinician thought she had. When one essayist says he doubts the relationship between parenchymal overgrowth and overfunction in the gland, I think back over the seventeen years that I have spent in examining more than 16,000 thyroids—minutely, not in a single section, but going over them piecemeal by the hundreds of sections—and when I look at my photographs, I ask myself, "Have I been mistaken? Is it after all true that there is not any difference between the histologic evidence, and the facts as shown by the clinician, or as thought to be present by the clinician?" We must keep our feet on the ground.

DR. W. B. CANNON, Boston: I understood Dr. Carlson to express himself as not being committed to morphologic change as indicative of disturbed physiologic function. And yet when he came to consider the relation of nerves and nerve supply to the glands of internal secretion, he used, as part of his evidence regarding these nerves of minor importance, the fact that after severance of the nerve little morphologic change in the gland is demonstrable. It seems to me that we should not expect more morphologic changes under these circumstances. If the glands of internal secretion to which the nerves go are also subject to humoral control, I would agree with him that so far as morphologic evidence is concerned it is of minor importance as bearing on the question of nervous control of the endocrine glands. Both he and Dr. Hyman were inclined to throw doubt on the evidence we had obtained that the thyroid is subject to nervous control, when we used the denervated heart as an evidence of activity. And the reason we threw doubt on that is that following the administration of thyroxin, no effect is noted for from twelve to sixteen hours, whereas in the stimulation of the nerve in the heart, it was determined that the effect began in fifteen minutes and reached its acme in about three quarters of an hour or an hour. Why that discepancy should throw doubt on the experiments I have called attention to is difficult for me to see. There is a discrepancy there, we see that; but why is the doubt thrown altogether in one direction? Here is a substance which has been removed from the thyroid, which has been put through complicated chemical processes, processes which we suppose have not left the substance in the original state. We are dealing with what is quite possibly a drug, a substance which, to be sure, is capable of affecting metabolism; but to assume that it is the physiologic substance in thyroid activity goes beyond any reason we are justified in taking. It is quite possible that thyroxin has to undergo a chemical change before it is capable of acting at all. In the experiments I described in which the animal was anesthetized and asphyxia was produced, the effects observed could properly be determined as physiologic in character. The discrepancy exists, but the doubt is not to be thrown wholly in one direction. Dr. Hyman asked why I had not called attention to observations made at the Western Reserve University which are contradictory to observations reported today. I hope Dr. Hyman did not intend to imply that I was suppressing the truth. I have so recently called attention to the defects in the evidence

that was presented by the workers at the Western Reserve University that it did not seem necessary to present that today. I have called attention to evidence published in papers lately that the explanation brought forth by those workers does not explain the results, that the amount of epinephrin set free is more than ten times the constant secretion of the suprarenal glands, and, furthermore, they used quantitative amounts, and an unknown amount was lost in preparing it for quantitation. Another paper in press tells of experiments which were performed on animals in which the only abdominal structures connected with the inferior vena cava were the suprarenal glands. When an afferent nerve was stimulated, the denervated heart showed characteristic effects due to these circumstances. If a clamp is placed above the suprarenal veins, the heart no longer increases its rate. When the clamp is removed, the heart promptly increases its rate. And, again, on stimulation the heart resumes its effect. If there is any other way of accounting for this than increased secretion of the suprarenal medulla and asphyxial stimulation, I would be pleased to have some one give me the explanation. So far as Dr. Levy's experiments are concerned, I wrote him about his control. He said he had five controls, animals whose thyroid had been removed previous to the experiment, and neither stimulation of the cervial sympathetic by electricity nor stimulation by large doses of epinephrin had any of the effects under these circumstances which they had when the thyroid is in the body.

DR. J. C. AUB, Boston: As to the metabolism in Addison's disease, I was careful to avoid going into the subject. In the first place, I do not think Addison's disease shows an abnormal metabolism; in the second place, the thyroid may well maintain a normal metabolism although the suprarenal may be disturbed. I have been able to find four cases recorded in the literature. These cases, however, have shown a lowered metabolism. I do not think that proves the situation, and I do not think an abnormal metabolism would be found in the disease.

DR. A. J. CARLSON, Chicago: If time had permitted me to read the complete paper, I think Dr. Wilson would have agreed that my feet were on the ground and that I in no wise deny the histologic findings of Wilson and others on toxic goiter thyroids. I merely question the usual interpretation of the facts. A slide of a toxic goiter thyroid is today no scientific evidence of hypersecretion. I am pleading for care in the interpretation of the histologic findings. The actual facts we all accept, but some of us cannot accept interpretations as facts. We have no intracellular microchemical tests for any secretion of the ductless glands, except, possibly, the suprarenal medulla. We can stain the thyroid colloid in the cells, but we do not know the relation of the thyroid colloid to the secretion. I have my feet on the ground, I think, in this subject, but I was trying to induce others to descend from the clouds. I agree with Dr. Cannon in regard to thyroxin. I did doubt Dr. Cannon's facts—he reports what he finds under the conditions of his experiments. No matter how stupid or uncritical we physiologists sometimes are, we are at least honest, and there would be less folly and no fakes in the field of endocrinology if there was simple honesty all around, coupled with a more general recognition of the "post hoc" policy. Most people seem to have accepted Kendall's thyroxin as being the true thyroid hormone. In my judgment, the case is not proved. Several of the speakers considered untenable the prevalent view that endocrine physiology and glandular extract action are identical with sympathetic nerve action. That is one of the generalizations that have led us astray. I am sorry that neither Dr. Hoskins nor Dr. Rowntree discussed what to me seems the real crux in the practical application of endocrine material in the treatment of disease; that is, when are organ extracts indicated? The question whether one should use the pluriglandular "dope" obtained in commerce, do one's own mixing, or employ single substances is of minor importance. But when the most extensive and carefully controlled organotherapy, experimental and clinical, is without effect, should we not stop this therapy, at least until we know more about the content of the organ extracts, and the etiology of the maladies we are trying to cure by them? Is it not time to say: "Physician, heal thyself"—of endocrinitis?

DR. L. F. BARKER, Baltimore: The difficulty seems to be in distinguishing between facts and interpretations of facts. It has been hinted that physiologic facts are all right and that histopathologic facts are all right; and there has been a suggestion that clinical facts are not all right. But accurate clinical observations are just as truly facts as are physiologic or histologic observations. Clinicians see signs and symptoms that occur together, and we call these groups "syndromes." The "aeroplane flight" occurs when we try to interpret what these syndromes mean. Thus, we should sharply distinguish between "Graves' syndrome" and "hyperfunction of the thyroid." The one may really explain the other, or it may not. We ought, therefore, to have clearly in mind precisely what we mean when we make use of terms. When we say "Graves' syndrome" we mean a group of clinical signs and symptoms, and when we say that "hyperthyroidism" is responsible for "Graves' syndrome," we are propounding a physiologic theory of interpretation of the clinical syndrome. If medical men would keep these things in mind, there would be less acrimonious discussion and fewer oblique hints of dishonest work!

DR. R. G. HOSKINS, Columbus, Ohio: The point I had intended to mention finally is the one Dr. Barker brought out: that there are many problems in this field that the physiologists cannot deal with. There are syndromes which involve endocrine glands that we cannot reproduce. The physiologist is responsible for the things he can do with the technic available to him. Also, there is responsibility on the clinicians to contribute from their point of view the phenomena which they see, and to put these contributions in a form and carry them out sufficiently, that they can ultimately be used in determining the important fundamental facts. While the problems are complex, it is not wise to be unduly impatient or pessimistic, but each one, clinician or laboratory investigator, with whatever technic is best suited to his problems, should press forward toward their solution.

LOW CERVICAL CESAREAN SECTION (LAPAROTRACHELOTOMY)

RESULTS IN ONE HUNDRED AND FORTY-FIVE CASES *

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The majority of the cesarean sections of the United States are being performed by general surgeons who have little knowledge of the mechanism of labor or of obstetric indications and the safe time for the operation. Therefore, the mortality is very high.

The mortality of the classic section is greater than is generally known, because statistics are hard to get. Twenty-one women died after cesarean section in Chicago last year, according to Dr. M. O. Heckard of the Vital Statistics Bureau. E. Holland and Munro Kerr compiled 3,314 cesarean sections performed for contracted pelvis in Great Britain in the years 1911 to 1920 inclusive, and found an average mortality of 4 per cent., the extremes being 1.6 per cent. in the early, clean cases, and 27 per cent. in those operated on late, or after delivery had been attempted.

At the Chicago Lying-in Hospital, in the last eight years, we had 122 classic sections. Six mothers died, two from peritonitis, three from the toxemia of pregnancy, and one from abruptio placentae. This is a good

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showing, and, with improved technic, postoperative complications have been diminished, but not as much as desirable; furthermore, the clean and early cases were the ones reserved for the classic cesarean section.

The operation (laparotrachelotomy) here proposed is intended to place in the hands of the surgeon a method which may be used when the conditions are not the best for the classic cesarean section. We have tried for centuries to bring the classic cesarean section to perfection, but have failed, as is evidenced by (1) the too high maternal mortality; (2) the high primary morbidity; (3) the late morbidity; (4) adhesions, and (5) rupture of the uterus in subsequent pregnancy and labor.

One of its most striking delinquencies is its limitation to clean and early cases. Otherwise it is unsafe, and since, in the majority of instances in which the abdominal delivery is required, the patient cannot be considered aseptic, one must expose her to unjustified risk, or choose delivery from below.

To circumvent these faults of the classic cesarean section, in recent years several new forms of abdominal delivery have been introduced. Frank of Bonn, in 1906, called attention to the operation of Joerg. Joerg, in 1809, had suggested that access to the parturient canal be gained from the flank in a manner similar to the ligation of the internal iliac artery; i. e., entirely extraperitoneally. Frank, however, opened the peritoneal cavity just above the pubis, and united the parietal to the peritoneum of the lower uterine segment, thus shutting off the peritoneal cavity, after which delivery was effected. Sellheim tried to push the peritoneum off the bladder in front; Latkzo pushes the bladder to one side and the peritoneum upward from off the lower uterine segment, gaining access to the uterus entirely extraperitoneally. More than twenty different modifications of the low operation have been proposed. All have the object, in common, to avoid manipulation in the general peritoneal cavity as much as possible, and to place the incision in the uterus entirely in the lower uterine segment. The idea is that the greatest dangers of immediate and remote complications come from opening the peritoneal cavity, and that an incision in the lower uterine segment will obviate rupture of the uterus in subsequent labor.

All the methods depend on certain anatomic changes which occur in the lower uterine segment and the overlying peritoneum and bladder during pregnancy. Owing to the softening and the loosening of the peritoneum and pelvic connective tissues, and to the development of the lower uterine segment in the latter months of pregnancy, and particularly during labor, the cervix is dilated and drawn away from the pelvis and from its relations to the vagina and the bladder. The vesico-uterine culdesac is usually obliterated. The peritoneum is easily moved on the subjacent structures. It is therefore possible, after incising this portion of the peritoneum, to push the bladder off its cervical attachments with great ease, and to expose an area of the cervix and lower uterine segment large enough for the delivery of the child without encroaching on that portion of the peritoneum which is opened in the classic cesarean section.

At the Chicago Lying-in Hospital we have recognized the theoretical value of the two main principles of the low cervical operation—the avoidance or limitation of peritoneal exposure, and the location of the uterine scar in the neck of the uterus—and we have devised a method of cesarean section which is considered by us standard. We reserve the old classic operation for special indications. The technic is based on Sellheim's third method, and we have added several features which protect the peritoneal cavity from seepage of lochia, and strengthen the scar in the lower uterine segment. We have given the name laparotrachelotomy to the operation, as this expresses exactly what it is—an incision in the neck of the uterus through the abdomen. Vaginal cesarean section would be called colpotrachelotomy.

TECHNIC

The operation is much simpler if the patient has been in strong labor for a long time. Uterine action stretches the lower uterine segment, and draws the cervix away from the bladder. We have done laparotrachelotomy in the eighth month of pregnancy before pains had started, but it is technically more difficult. A Pfannenstiel incision may be used, but we usually make the cut in the middle line, and it need be only 14 cm. long, beginning at the pubis. We make the fascial incision 1.5 cm. to the left of the linea alba, and then draw the rectus muscle from its sheath at the middle line and open the peritoneum extramedially again. Thus, the rectus muscle is mortised into the fascia when the wound is closed, preventing hernia. The bladder is usually high on the abdominal wall. It is pushed down and to the right. The lower uterine segment is exposed with retractors, and a cross cut made in the peritoneum, about 2 cm. below its firm attachment to the uterus. The cut extends in a slightly curvilinear direction, 5 cm. on each side of the middle. The lower flap of the peritoneum is reflected downward, carrying with it the bladder. The upper flap is pushed upward to a point which delimits the upper end of the intended uterine opening.

This method of technic was used by us several years before Beck published his description of the operation. After the bladder has been pushed down far enough to expose a surface sufficient for the child's delivery, the upper and lower poles of the area of incision are steadied by Allis forceps, and the hook knife is passed into the uterus, alongside the upper Allis forceps, and brought out at the lower end just at the edge of the bladder. With a slow, gentle, sawing motion, the thin uterine wall is cut. The blood and liquor amnii are sucked out of the field by means of a vacuum pump. The face of the child is now pulled into the wound by means of a finger introduced into its mouth, and forceps are applied, or the head may sometimes be expressed by means of pressure applied in the flanks. Hurry should always be avoided. There is no occasion for it. Pituitary extract is given hypodermically. Ergot was given just after the anesthetic was started.

The placenta usually separates and appears in the wound if one waits long enough, but we wait only three or four minutes, employing this time in grasping the edges of the uterine wound with tongue forceps, to stop the bleeding from the uterine sinuses (which is usually not disturbing) and to lift them up for suture. The placenta may be expressed by the method of Credé or removed manually. Then the uterus is carefully wiped smooth with a dry lap sponge, packed temporarily with a long narrow lap sponge, and now the lower uterine segment is carefully sewed up. We use No. 2 twenty day catgut, beginning near the bladder, taking in half the thickness of the wall in the first row, going down to but not through the mucosa. At the upper end of the wound, the suture is locked; then

returning, the other half of the wall is sutured, the end being tied to the first knot.

Now the fascia over the lower uterine segment is reunited with a special row of catgut sutures, which are so placed that the edge of one side overlaps that on the other 0.5 cm. This is our second contribution to this operation. Now the upper flap of peritoneum is pulled down over the fascia and fastened down with two or three stitches, and finally the lower flap, carrying the bladder, is pulled up over the upper flap, and closed with a continuous suture. Occasionally a superficial vein bleeds. Before the peritoneum is sewed all bleeding must be stopped. This is easily done by means of an X shaped individual suture.

The peritoneal toilet is very simple, as blood will be found only in the culdesacs below the round ligaments. If the peritoneal cavity has been walled off with lap sponges, even this soiling of the field may be avoided. Usually the intestines and the omentum are not seen at all.

RESULTS

By this method (more or less perfected as we went along) we have performed 145 laparotrachelotomies. The results in these 145 cases are very favorable. Only one woman died:

A primipara, aged 45, weighing 278 pounds, had been in labor four days. The membranes had ruptured forty-eight hours or more before; the blood pressure was systolic 208, diastolic 160, and marked albuminuria, edema, etc., were present. The pelvis was contracted, the occiput posterior. The head was high, even after days of labor. The usual low cervical cesarean section was attended with great technical difficulties because of the obesity. Death occurred the fifth day from peritonitis. She was a bad risk and might not have survived delivery from below.

None of the babies died, except two that were dead before entry to the hospital—both from abruptio placentae.

Of the 144 women who recovered, fifty-four had a temperature of 100.4 F. for not longer than one day, nine had 100.4 or over for three days, and sixteen had 100.4 or over for more than three days. Most of this morbidity cannot be explained, as the course of the wound healing was not often abnormal. As may be seen, in fifty-four out of seventy-nine cases, the elevated temperature lasted less than twenty-four hours, and probably belongs to the class of "fibrin ferment" fevers.

There were three cases of phlegmasia alba dolens, all mild; five cases of pyelitis, and eight of bronchitis and bronchopneumonia—this was during the influenza season. In nine cases the wound broke down, and in only one was the drainage made by the vagina, and through the cervix. Bronchopneumonia was a complication in three of these nine and in one of the phlegmasia cases, and probably causative of the local suppuration. In not one of the cases was ileus present, and tympany was a prominent symptom in only five. Vomiting was also an unimportant complication. In the last thirty-six cases, with improved technic, only seven women vomited, and each only once. We have not heard that any of our patients had ruptured uterus in subsequent labor. One had a low forceps operation after a good test of labor. Four were delivered by a second low cervical section, and the scar could hardly be found. Adhesions were present in one case—one of the two in which suppuration occurred and the patient had pneumonia.

Since many of these women had been in labor hours and days with the bag of waters ruptured, and had had vaginal examinations made, three had forceps attempts and many were poor risks, the results must be called good, and there should be reasons for them. We believe that these advantages accrue from the fact that the incision is made in the lower uterine segment.

ADVANTAGES OF LAPAROTRACHELOTOMY

1. The cervix stands infection better than the fundus because it is used to it—the local immunities are developed. Gynecologic operations bring daily proof of this fact.

2. The lower portion of the abdomen is more resistant to infection: hence the rationale of the Fowler position.

3. The cervical wound is at rest, unaffected by after-pains, and can heal in peace. In the classic cesarean section the uterine muscle contracts frequently and the sides of the wound grind on each other; indeed, the action of the muscle actually pulls the edges apart. This allows blood to fill the gaps, and the blood is readily infected when the bacteria invade the puerperal uterus, as they invariably do on the fifth day. There are fourteen cases on record in which the uterus actually burst itself during the puerperium, regardless of the suture material used. This fact will explain some of the cases of so-called "late shock" after cesarean sections.

4. The healing of the cervix is better than that of the fundus because active involution and the fatty degeneration of the uterine wall defeat the healing power of the tissues (Munro Kerr).

5. There is relatively little danger of leakage of the lochia. First, the wound edges can be perfectly coapted and covered with both tough fascia and peritoneum. The classic section wound is closed by sutures which must at the same time stop hemorrhage. They must be tight, and therefore subject the tissues to necrosis and infection, and, further, they are likely to be torn or untied through the after-pains. Indeed, so great is this danger that even late writers recommend silk and silkworm-gut for suture material! Secondly, should lochial leakage occur, in the low cervical operation the infection takes place under the bladder peritoneum and bladder, where it is most easily reached, if the pus does not, as usual, work its way out (*a*) through the skin, (*b*) through the cervix, or (*c*) by means of anterior colpotomy. We know that lochia frequently seeps through the uterine wound after classic cesarean section, and in such instances the seepage goes into the free peritoneal cavity as high as the liver, if the bladder is full. Bacteria traverse the wound from the infected endometrium in the same manner.

Most operators believe that the danger of infection is not so much from the spill at the time of the operation as from seepage of lochia and passage of bacteria along the line of suture after the delivery. In the trachelotomy, the spill is limited to a very small area of peritoneum, just above the pubis, an area known to resist invasion of bacteria well, and thus the low incision also minimizes even the danger of the spill.

6. The incidence of adhesions is reduced almost to zero when the cut is made in the cervix. The intestines and omentum do not come into view, as a rule, and there remains in the abdomen one short line of suture (not over 3 inches) without even a knot. This line of suture sinks deeply into the pelvis when the uterus

comes forward and when the bladder fills; thus intestine and omentum cannot adhere to it.

7. The possibility of rupture of the scar in subsequent pregnancy and labor is reduced to a minimum. There are only two cases on record of actual rupture of the scar in a later labor, and we know of a third in which the scar would probably have torn, had labor set in. In vaginal trachelotomy we have analogous conditions. No one has reported a rupture after vaginal cesarean section. The reasons for this integrity of the cervical as compared with the fundal incision scar are many: (*a*) The primary wound healing is better, and, too, the muscle suture is covered with a thick fascial layer; (*b*) the stretching of the scar in labor is passive, not the lateral traction, as on a fundal scar; (*c*) the critical time occurs late in labor, which gives us opportunity to anticipate it; (*d*) the placenta located on the fundal scar weakens it most dangerfully—the placenta seldom locates itself in the cervix; (*e*) if rupture does occur, it is in a bloodless portion of the cervix, and is most easily recognized and reached by operation. Holland gives the frequency of uterine rupture after cesarean section as 4 per cent., with a mortality of 30 per cent. Important! See King's paper read at the same meeting.

8. We can give the parturient a real, objective test of labor. Routh and Holland have proved by large statistics, and every one's daily experience confirms the fact, that women who have labored many hours, when the membranes are ruptured, many vaginal examinations have been made, etc., are poor risks for the classic section. In German clinics, the low cervical operation is performed even if the parturient has fever.

9. Abdominal hernia has not yet occurred in any of our cases, even after those that suppurated. Hernia is not rare after the classic operation. The incision above the pubis is in thick muscle and fascia, and union of the structures can be made so as to avoid hernia. We have tried the Pfannenstiel incision in eight cases and have given it up, as also have continental operators.

CONCLUSION

For these nine reasons we prefer the laparotrachelotomy, and employ it in all cases in which abdominal delivery is indicated. In excessively obese women, in pendulous abdomen, the classic operation may be required. We have performed the low cervical operation six times for placenta praevia. It was technically difficult in only two cases. All the mothers and babies lived. It facilitates the Porro operation, and is therefore to be preferred when the uterus is to be removed. When a woman has had a previous classic cesarean section, one may still do the low operation, although one usually wishes to go through the old scar to cure a hernia or for cosmetic reasons.

We feel sure that if the general surgeons will learn this operation, and it is not difficult to a man who can do a cholecystectomy, there will be an appreciable reduction of maternal mortality in the United States.

426 East Fifty-First Street—122 South Michigan Avenue.

Eradication of Venereal Diseases.—The danger of transmitting syphilitic and gonorrheal infection through the marital relation, through illicit sexual intercourse, and, extragenitally, through intimate contact, is generally recognized by all who have any knowledge of venereal diseases; but the importance of early diagnosis and treatment in the eradication of syphilis and gonorrhea is not appreciated so generally. —A. J. Casselman, *Public Health Rep.* **36**:851 (April 22) 1921.

THE END-RESULTS OF ABDOMINAL CESAREAN SECTION*

E. L. KING, M.D.
NEW ORLEANS

The gradual extension of the indications for abdominal cesarean section and the growing popularity of this method of operative delivery justify an occasional review of our cases and an inquiry into the ultimate results. Many studies along these lines have been published, but the question as to the proper care at a subsequent labor of the patient who has had a cesarean section is still open for discussion.

TABLE 1.—RESULTS OF CESAREAN SECTION IN A SERIES OF CASES

Year	Recovered	Died: From Operative Causes	Died: From Disease	Later Pregnancy Possible
1909	0	1	0	0
1910	0	0	0	0
1911	1	1	2	1
1912	2	0	1	2
1913	2	2	1	2
1914	4	2	3	4
1915	6	2	0	6
1916	10	2	2	10
1917	6	2	3	6
1918	7	0	2	7
1919*	19	1	3	18
1920	4	1	6	4
1921*	15	2	2	0
Total	76	16	25	60

* One patient sterilized by request at second cesarean section.

TABLE 2.—INDICATIONS

	Multiparas	Primiparas	Not Stated
Placenta praevia	9	4	2
Abruptio placentae	2	..	..
Eclampsia	5	39	17
Contracted pelvis, absolute	..	4	..
Contracted pelvis, relative	8	5	3
Transverse presentation	..	1	..
Face presentation	1	..	1
Decompensated heart	..	2	1
Chancroids of vulva	..	1	..
Toxemia	1	1	..
Previous cesarean section	4	..	..
Not stated	2	2	2
Total	32	59	26

It is generally conceded that the immediate results vary according to the previous handling of the case, and that the chief risk is that of infection following vaginal examinations and manipulations. The mortality and morbidity percentages under ideal conditions should be very low, but these ideal conditions are not encountered in every case. Thus, in 117 abdominal cesarean sections at the Charity Hospital of New Orleans (excluding the Porro cases), there were twelve deaths from peritonitis and two from sepsis; all of these patients had had vaginal examinations or attempts at delivery before operation. The majority of the seventy-six patients recovering had fever, the puerperium being absolutely afebrile in only seventeen. Polak[1] is of the opinion that this high morbidity percentage is due to the fact that the majority of puerperal uteri contain pathogenic organisms by the fifth or sixth day, at which time the suture line often offers a suitable area for infection. He gives the incidence

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Polak, J. O.: The Present Status of Operative Obstetrics, Referring to the Abuse of Cesarean Section, Surg., Gynec. & Obst. **34**: 567-573, 1922.

of fever as 28.8 per cent. in uncontaminated cases, with a rise to 50 per cent. in cases in which the patient has been previously examined.

In an endeavor to obtain some light as to the end-results of the operation, I have reviewed the records of 117 patients operated on at the Charity Hospital by twenty-five surgeons, and also the records of thirty-three private cases handled by five surgeons. The mortality, morbidity, causes of death, results as concerns the fetus, end-results in those cases followed up, etc., are shown in the various tables. Of sixty Charity Hospital patients in whom subsequent pregnancy was possible, six have not become pregnant since, six have passed through normal labors, two were delivered by forceps after long second stages (one by the Scanzoni methods for unrotated right occipitoposterior position), one has had a second cesarean operation, two have miscarried, one returned with a ruptured scar, one died eighteen months after operation when six months pregnant, and forty-one could not be located. Of the twenty-seven private patients (on whom thirty-three sections were performed), two were delivered normally, four had a second cesarean section, one had three cesarean sections, four were patients cared for in 1921 (in whom subsequent pregnancy is as yet hardly possible), one sustained a ruptured scar at subsequent labor, five died (one after her second cesarean section), and ten in whom subsequent pregnancy was possible have not been traced.

The possibility of rupture of the cicatrix at subsequent labor is the chief and most dreaded danger, and unfortunately the condition of the scar is in most instances an absolutely unknown factor. Gamble [2] has shown than an afebrile puerperium does not guarantee a well-healed uterine wound. Findley,[3] in 1916, collected sixty-three cases of rupture of the scar in subsequent labor, with seventeen maternal deaths. Holland,[4] in 1920, brought the total up to ninety-seven, with twenty-eight maternal deaths. Gamble, in 1922, reported a case occurring at the Johns Hopkins Hospital. Doubtless several others could be found scattered through the literature. In our series, subsequent rupture occurred twice in the cases followed up (these two cases are included in Findley's and in Holland's series); and four cases of ruptured scar occur-

TABLE 3.—MATERNAL MORTALITY *

Cause	Due to Operation	Due to Disease
Eclampsia (total number of cases, 61)	..	20
Peritonitis	12	..
Sepsis	2	..
Exhaustion (long labor before operation)	..	2
Decompensated heart	..	2
Reopening of abdominal wound and shock	1	..
Placenta praevia and hemorrhage	..	1
Acute dilatation of stomach	1	..
Total	16	25

* Six of the deaths due to infection occurred prior to 1915, out of a total of twenty-two operations. Ten occurred subsequent to 1915, out of a total of ninety-five operations. In one case of supposed exclusion of the peritoneal cavity by suture of visceral (uterine) and parietal layers the patient died of peritonitis. In one case the uterine wound was found partly open at necropsy.

TABLE 4.—CONDITION OF THE INFANTS *

Born living and discharged alive		92
Stillborn, eclampsia cases	9	
Stillborn, placenta praevia cases	3	
Stillborn, contracted pelvis cases	3	
Stillborn, heart cases	1	
Stillborn, premature	3	
		19
Premature, died after delivery (in hospital)		6
Full term, died after delivery (in hospital)		2
Total		119

* There were two pairs of twins; one pair, premature, died; one pair lived.

TABLE 5.—MORBIDITY OF PATIENTS RECOVERING

	Fever	No Fever	
Potentially infected *	30	10	
Not infected	4	2	
Not stated (no record as to vaginal examinations)	23	5	
Total	57	17	
No temperature record			2
Total of all cases			76

* In one case, there was fever on admission; in another pyelitis developed during puerperium; in two there were infected wounds.

TABLE 6.—FOLLOW-UP OF CHARITY HOSPITAL CASES

Pregnancy possible		60
Not pregnant since operation	6	
Pregnant, normal delivery once	3	
Pregnant, normal delivery twice	1	
Pregnant, normal delivery three times	1	
Pregnant, normal delivery, also aborted	1	
Pregnant, forceps delivery *	2	
Pregnant, aborted once	1	
Pregnant, aborted three times	1	
Died at sixth month of pregnancy	1	
Pregnant, second cesarean section	1	
Pregnant, ruptured scar	1	
Unable to locate	41	
	60	60

* One of these patients is now near term in her second pregnancy since the cesarean section.

TABLE 7.—PRIVATE CASES

Number of patients		27
Number of sections		33
One section	22	
Two sections (4 patients)	8	
Three sections (1 patient)	3	
Deaths		5
Sterilized at second or third section		3

TABLE 8.—INDICATIONS IN PRIVATE CASES

Heart disease	1
Eclampsia	5
Contracted pelvis, relative	7
Placenta praevia	1
Large baby, long labor, no progress	7
Previous myomectomy	1
Previous cesarean section (most of them performed because of a contracted pelvis)	7
Not stated	4
	33

TABLE 9.—DEATHS IN PRIVATE CASES

Cause	Number
Eclampsia	2
Acute dilatation of stomach (one patient after second cesarean section)	2
Infection (long labor prior to operation)	1
	5

TABLE 10.—SUBSEQUENT HISTORY OF PATIENTS RECOVERING (PRIVATE CASES)

	Number of Patients
Second cesarean section	4
Second and third cesarean sections	1
Normal delivery, once	1
Normal delivery, three times	1
Ruptured scar at second pregnancy	1
Not traced, pregnancy possible	10

2. Gamble, T. O.: A Clinical and Anatomical Study of Repeated Cesarean Section with Especial Reference to the Healing of the Cicatrix and to the Occurrence of Rupture Through It, Bull. Johns Hopkins Hosp. **33**: 93-106 (March) 1922.

3. Findley, Palmer: Rupture of the Scar of a Previous Cesarean Section, Am. J. Obst. **74**: 411-432 (Sept.) 1916.

4. Holland, E.: Rupture of the Cesarean Section Scar in Subsequent Pregnancy or Labour, Lancet **2**: 591 (Sept. 18) 1920; Proc. Roy. Soc. Med., London, Sect. Obst. & Gynec. **14**: 22 (Nov.) 1920.

ring in patients operated on in other institutions came under our observation.

Many observers have noted at cesarean operations which were the second undergone by the patient thin cicatrices which might have ruptured had labor been permitted. Thus, Harrar,[5] at the New York Lying-In Hospital, in fifty repeated cesarean sections, noted thin scars in four cases, partial rupture in two, and complete rupture in two. Van Leuwen[6] found twenty thin scars reported in 117 collected cases in which the condition of the cicatrix was noted. Gamble states that, of fifteen cases in which the uterus was removed and in which definite information as to the former puerperium was available, the following points were noted: of seven cases with previous febrile puerperal periods, no trace of the scar could be found in six instances, and it was only slightly thinned in one specimen. In eight cases in which there was no fever after the previous operation, the scar could not be located in three specimens; while healing was good in three, fair in one and poor in one. In our series, of ten second cesarean sections, the cicatrix was noted as thin in three cases, and strong in two; while its condition was not noted on the record in five instances. These thin scars are the dangerous ones. It is universally conceded that a well healed scar will stand the strain of subsequent labor. In fact, in this connection, the term "scar" is really a misnomer, as in such cases healing takes place by muscular regeneration across the gap, rather than by the formation of connective tissue.

The chief factor involved in the production of a defective scar is infection of the uterine wound, which we assume to be a probability when the puerperium is febrile. Newell[7] holds that repeated section should be considered obligatory in patients with a history of fever during convalescence. Gamble's[2] observations on fifteen cases, however, tend to show that the character of the convalescence cannot be used as a criterion as to the condition of the uterine cicatrix. Findley holds the same opinion. The suture material has been blamed; and Holland contends that catgut is the least trustworthy, with a rupture incidence two and one-half times as great as is the case when silk is used, and that silkworm gut appears to be best of all. Others feel that the material used in suturing the uterus is a secondary consideration, and that the suture technic is the all important factor. The sutures should not be placed until the uterus has contracted and retracted, unless free bleeding forces one to hurry, and they should be tied tightly in order to allow for subsequent relaxation due to the "unrest" of the uterus. The occasional attachment of the placenta to the scar has been mentioned as a factor in producing rupture, but it seems to play a minor rôle in the etiology. Thus, in our six cases of ruptured scar, the location of the placenta was noted in but one instance, and in this patient it was on the posterior wall of the uterus, and not over the cicatrix. In the ten repeated sections, it was over the thinned-out scar in one case, not over it in one case, and not noted in eight.

The location of the incision is a matter of importance, the transverse fundal type being generally held to be especially weak. Barris,[8] however, takes the contrary view. Only one case of rupture of the scar following transperitoneal cervical section was found by Holland. We must bear in mind, though, that this operation has not been employed nearly so often as the classic section, so that judgment must be suspended until more evidence has been accumulated. Other factors mentioned are: autolysis of the uterine muscle fibers, the "unrest" of the muscle during involution (Kerr[9]), incision over the placental site, and degeneration of the muscle fibers in cases of eclampsia and toxemia. Operative manipulations, excessive distention of the uterus, the use of pituitary extract, etc., are accessory factors, especially when the cicatrix is already weak. It is interesting to note that rupture often occurs in the absence of labor pains, at times several weeks before term. In one of the cases of this series, the uterus ruptured at seven months, while the patient was performing her usual household tasks.

The frequency of this accident has been variously estimated. In our series, of seventy-eight patients in whom subsequent pregnancy was possible, only twenty-three could be traced, in whom twenty-three full term pregnancies occurred; the scar ruptured in two of these cases. Findley concludes that "not more than 2 per cent. of ruptures occur in subsequent labors," but gives no figures to support this contention. Holland collected statistics from twenty-six hospitals and surgeons in England, with the following results: total number of cases, 1,605; followed up, 1,103; no subsequent pregnancy, 613; subsequent pregnancy, 487; outcome of the pregnancies: (1) natural delivery, 78; (2) repeated cesarean section, 352; (3) aborted, 47; (4) patients pregnant when heard from, 86; (5) ruptured scar, 18.

Adding 1, 2 and 5, he gets a total of 448 pregnancies at or near term, with eighteen ruptures, or an incidence of 4 per cent. But Holland apparently failed to note that 352 of these were delivered by cesarean section. Some of them may have had the test of labor and hence a test of the scar, but this point is not mentioned. Eliminating these 352, we have ninety-six patients who were allowed to test out the cicatrix, with eighteen ruptures, or 18.75 per cent. Similarly, Gamble, in a study of sixty-three pregnancies occurring in fifty-one women previously subjected to cesarean section, reports one ruptured scar, an incidence of 1.5 per cent. But only seventeen of these cases terminated in vaginal delivery; the other forty-five patients were again delivered by cesarean section. Hence, the correct figure would be one rupture out of eighteen tests of labor, or 5.5 per cent. This percentage is lower than the one obtained from Holland's larger series; but we must bear in mind that Gamble's report is based on the work of a single well-organized clinic. Holland's figures, covering the work of twenty-six different hospitals and surgeons, certainly present a more accurate picture of the results to be expected in average hands, and serve to emphasize the fact that subsequent rupture is a real menace.

A brief review of the six cases of ruptured cicatrix embraced by this report follows. This accident may occur without occasioning very grave symptoms; this point was noted in three of our cases.

REPORT OF CASES

CASE 1 (Previously reported by C. Jeff Miller to Findley and included in his and in Holland's series).—Cesarean section was performed after long labor with failure of engage-

5. Harrar: Am. J. Obst. 65: 808, 1912.
6. Van Leuwen: Ann. de gynec. et d'obst., October, 1904, p. 577.
7. Newell, F. S.: Cesarean Section, New York, D. Appleton & Company, 1921, p. 133.
8. Barris: Discussion of Holland's paper (Footnote 4).
9. Kerr, J. M. M.: Proc. Royal Soc. Med. London, Sect. Obst. & Gynec. 14: 121-131, 1920.

ment of the head. There was febrile convalescence. Labor occurred at full term fifteen months later. The patient was placed on the operating table, as trouble was feared. Rupture of the scar occurred, and the patient died before the abdomen could be opened.

CASE 2 (Included in the two series mentioned above).—The patient was operated on in the Charity Hospital in 1914, on account of a borderline contracted pelvis. She was admitted in labor, with the membranes ruptured, and a temperature of 101.6 F. There was a rise in temperature during the puerperium; the wound was clean. The patient was readmitted to the same hospital in labor at term eighteen months later. Her general condition was good, but she gradually became worse, and developed severe abdominal pain. Laparotomy was performed by Dr. M. J. Gelpi, and the scar was found to be ruptured. The dead fetus was removed, the cicatrix was excised and the wound was sutured with three layers of catgut. The histology of this scar, as well as of that in Case 5, and of the uterus in Case 6, will be reported in detail by Dr. Gelpi.

CASE 3.—The patient, aged 18, was admitted to Charity Hospital, March 26, 1916. She had undergone cesarean section two years before in Chicago. This was a case of borderline contracted pelvis (spines 23 cm., crest 26 cm., trochanters 28 cm., external conjugate 18 cm., internal conjugate 8 cm.). The patient had been in labor two days, and the membranes had ruptured six hours previously. One c.c. of pituitary extract was given by the midwife two hours before admission, after which the pains became very severe, and then stopped. The general condition was fair on admission. At operation, the scar of the previous operation in the lower uterine segment was found ruptured; very little hemorrhage had occurred, and the dead fetus was removed from the uterus by forceps. The uterus was sutured; a stormy, septic convalescence followed. The patient was delivered by cesarean section again, Sept. 7, 1917, at another institution.

CASE 4.—The patient had been operated on at another institution about two years previously. Indication for operation was not ascertained. She was admitted to the Charity Hospital with a history of indefinite abdominal pain and slight vaginal bleeding for several days. She was very ill with bronchopneumonia, and died in three days. At necropsy, the dead and macerated fetus was found free in the abdominal cavity, and the cesarean scar was ruptured. This had no doubt occurred before admission.

CASE 5.—The patient had been operated on at another hospital two years before for placenta praevia. Dec. 25, 1919, when she was about seven months pregnant, the uterine cicatrix ruptured, with no previous labor pains. Immediate operation, with removal of dead fetus, excision of scar and suture of the uterus, was performed, followed by transfusion. Recovery ensued, following a temperature of from 100 to 101 F. for four days. The wound was clean.

CASE 6.—This patient (Case 5) returned to the hospital on Dec. 16, 1920, with symptoms of ruptured scar, but in much better general condition than when previously admitted. At operation, the cicatrix was found to be ruptured, the living child was removed and supravaginal hysterectomy was performed, with recovery. The patient is now in excellent health.

COMMENT

In this connection, I may note that in one of the fatal cases of the Charity Hospital series, an attempt was made to exclude the abdominal cavity by suturing the uterine to the parietal peritoneum. The patient died of peritonitis. Evidently, the suture line was not infection proof, a point which is stressed by Newell. In another fatal case, the upper end of the uterine incision was found to be necrotic and open at necropsy, with free communication between the uterine and abdominal cavities. In a very recent case (not included in this series), peritonitis developed on the eleventh day, and death occurred three days later. Necropsy disclosed the fact that the uterine incision had opened for its entire length and depth, and streptococci were isolated from the uterine and abdominal cavities. Each of these patients had been examined only twice, no attempt at delivery from below having been made. In each case, the indication was a borderline contraction of the pelvis.

CONCLUSIONS

It appears, then, that we should restrict rather than broaden our indications for cesarean section. In our obstetric teaching, we must lay more and more stress on the importance of prenatal care, including especially the importance of careful pelvimetry and of the early detection and proper treatment of toxemia. Craniotomy or embryotomy on the dead baby can be resorted to more frequently, pubiotomy may occasionally be employed, and the use of the Porro operation can be advantageously extended in infected cases. The low extraperitoneal operation, through the lower uterine segment, or partly through this structure and partly through the upper portion of the cervix, is being developed and popularized by the work of De Lee, Polak, Kerr, Blair Bell and others, and bids fair to become the operation of choice in the great majority of cases in which there is infection, especially if its claim to a lower percentage of subsequent rupture of the scar is borne out by experience.

Medical Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DE LEE AND CORNELL AND OF KING

DR. CHARLES E. PADDOCK, Chicago: Twenty-five years ago when I performed my first cesarean section, the only indications for the operation were contracted pelvis, or tumor obstructing the pelvic canal. Today the indications seem to be multiple; sometimes even the wish of the patient to have her baby in this way is considered an indication. No wonder that cesarean operations are reported by the hundreds. Obstetricians boast of rather than conceal the number of these operations. Up to the present time the classical cesarean section in which the uterus is opened in the upper segment has been the operation of choice. There have been many attempts to make the operation an extraperitoneal one, which has not always had good results. The operation under discussion today, the so-called cervical cesarean section, is new only in a few minor modifications. I should heartily welcome an improvement on the classical cesarean operation, but I cannot feel that the lower segment operation is the better operation. I agree with Heany and Holmes and others of my colleagues in their belief that the classical operation has a lesser mortality and morbidity. Under the worst conditions, my results in the classical cesarean section have been excellent. I have operated under the most insanitary conditions and in infected cases without a maternal or fetal death. One cannot ask better results. True, in two of my cases in which operation was performed many years ago, the uterus ruptured in subsequent pregnancies. But with the present technic I think such a happening impossible. Besides, such misfortunes have happened in the lower operation as well, although its advocates claim the contrary. I wonder in how many of the 144 cases reported on today the incisions extend into the upper segment of the uterus. And why prefer an operation that takes an hour and a half when the classical operation takes half an hour? And why report only things favorable to the operation? The advocates of the lower segment operation claim that by this method the spill does not enter the peritoneal cavity. There is as much danger of the spill getting into the abdominal cavity in this operation as in the classical operation. Not only do statistics prove this to be true, but I have seen it myself. Not long ago I had occasion to perform the classical cesarean operation in several cases in which I had operated previously. I

found comparatively no adhesions. And, on the other hand, not long ago, I saw a second cesarean section through the lower route, and found extensive adhesions.

DR. RUDOLPH W. HOLMES, Chicago: There is nothing to show that any modification of technic of modern cesarean section has improved morbidity and mortality, whether classic or low cervical. All the phenomenal lowering of morbidity and mortality has come from a refinement of individual skill, and the adoption of ultramodern principles of surgical methods. Success of modern cesarean section depends more on the skill of the conscientious operator and his operating room personnel than on any other single factor. As a corollary, success has been obtained by a proper conduct of labor before the section—absence of vaginal examinations, minimum of rectal examinations, and proper supervision during the hours of labor. Conversely, the woman subjected to a cesarean section in advanced labor is jeopardized by the fact that unknown by-products of forced metabolism are developed which undoubtedly lower immunity. Supplementing this, prolonged rupture of membranes is grossly inimical to the woman's welfare. High mortality is due to frequency of vaginal examinations and attempts at delivery. The haphazard methods of the occasional operator doing a section, with inadequate facilities, have made the high mortality in many parts of the country. This is typified by statistics computed from the experience of a number of operators. The unskilled operator, the injudicious placing of indications, all spell disaster. The figures thus obtained are infinitely higher than in the experience of a few operators with considerable numbers of sections. Today, the cesarean section mortality should not be more than 1 or 2 per cent. in safe hands. Kerr, twenty years ago, stated that the one advantage of the Fritsch incision was that it was farthest from the potentially infected cervix. It has not been proved that the same skill and obstetric conscience brought to bear in the classic section offers one whit worse mortality and morbidity than this reintroduced low cervical section. There is only one way to prove the advantage—by having the individual operator do alternate classic and low cervical sections with the same placing of indications. Latzko's method, improved by Beck, which De Lee follows in essential detail, according to Beck, has more marked postoperative reaction than has classic section, owing to the greatly increased traumatism of tissues. I admit a marked difference of tolerance between the peritoneum about the liver and stomach and that of the pelvis. No clinical evidence has yet been adduced which will substantiate the allegation that the corpus peritoneum is more susceptible to bacterial invasion than that on the lower segment. The "spill" of blood and liquor amnii in all types of cesarean section is comparable. Three of my first five sections up to 1906 ended fatally. In the succeeding eighty-five cases of classic operations done on nontoxic women, one woman died of a focal infection emanating from the throat, sequential to a severe cold, pleurisy, etc. Of the first thirty-seven patients up to 1913, 13.5 per cent. had delayed convalescence; of the last fifty-three, this incidence was 7.2 per cent. The lowered mortality of classic and low cervical cesarean sections is almost entirely independent of a selection of cases, since indications for cesarean section these last few years, in many quarters, virtually includes every reason which might obtain before the birth of the child. Indications for cesarean section must be curtailed, not broadened. A section is at least ten times as dangerous as a normal labor.

DR. GEORGE GELLHORN, St. Louis: Six or eight years ago, before Dr. De Lee took up this work, I happened to perform a small series of four low cervical cesarean sections in quick succession, and was very much pleased. Hirst and I published our results about the same time. Then I happened to see Asa Davis do a high incision at the Lying-In Hospital in New York. I was so fascinated by the lightning rapidity of the operation that ever afterward I made this high incision. In virtually every case, however, no matter how much painstaking attention I had paid to asepsis, the selection of the case before the operation and to the most careful surgical technic, I observed slight rises of temperature without any tangible evidence as to the cause of it; and I was forced to the conclusion that either the uterine incision was not healing properly, or more likely, there was a formation of adhesions. In most of my cases and many of those done by others with this high incision, I have found the uterus fixed by adhesions in abnormal position and I could further verify the diagnosis of adhesions on doing a second laparotomy. And yet I had taken special precautions against adhesions. Recently, I have gone back to the low cesarean section and I am much pleased with it. I do not do such operations very often. As a matter of fact, I very much applaud the remark by Dr. King that the indications for cesarean section should be restricted rather than enlarged. There is just one technical detail which will make the operation that Dr. De Lee and Dr. Cornell described today still more attractive. If Dr. De Lee will operate on his patients in the Trendelenburg position, he will be able to incise the cervix alone. The criticism of Dr. Paddock was very true. The incision in this operation was partly in the uterine muscle. We do not need to put it in the muscle. As soon as the incision extends into the muscle, it is subject to all the disadvantages of the constant contraction and that unrest which interferes with perfect wound healing. Somebody claimed that there have been cases of rupture recorded after cervical cesarean section. I am quite sure that that is true. What method is there that will yield perfect success in 100 per cent. of cases? Dr. Holmes' "classical" cesarean section will not do it, nor will any other method ever be proof against such a complications. But I believe that the cervical incision offers greater safety than the other methods. In speaking of the classical operation, I wish Dr. Holmes had defined what he meant. We think of the enormous incision with the whole uterus pulled out of the abdomen as the "classical" section. I cannot imagine that he means that antiquated method. He must mean something like the high incision.

DR. HOLMES: The anterior incision.

DR. DAVID S. HILLIS, Chicago: In the last five years I have had considerable experience with the low cervical cesarean section; about fifteen of the operations included in this series were done by me, and about twice as many at another hospital. There are two important things desirable in cesarean section: the first is to reduce the danger of infection at the time of the operation, when it is not done early or when it is done after the test of labor. The second is to reduce the danger of a rupture of the scar in a subsequent pregnancy. It is not claimed that this operation solves the whole question on these two points; but if it accomplishes either purpose to any extent, it deserves a place in obstetrics. With regard to results: I have observed the work in the Lying-In Hospital during the period covered by the statistics given in this paper, and it is a fact that since the low cervical operation has been done, the field for the operation has been extended quite decidedly in the direction of the suspicious or possibly infected case. During the time the classic operation alone was performed, the indication for classic cesarean section was closely restricted to the clean case. With regard to the scar in the lower uterine segment, that is a point which still permits of some discussion. This operation is best adapted to the cases which have been in labor for some time, in which the lower uterine segment is increased in length so that there is plenty of room to make an incision long enough to permit the passage of a large head. When the operation is done before labor starts, there is at times difficulty in finding room enough in the lower uterine segment to extract the head without invading the contracting portion of the uterus with the incision. I do not believe that this operation should entirely supplant the classic cesarean section, because there are some cases to which it is not so well adapted. There is no question that the low cervical cesarean section has come to stay, and it is certainly a valuable addition to the methods of abdominal delivery.

DR. BENJAMIN H. BREAKSTONE, Chicago: I agree absolutely with Dr. Holmes, except that he is somewhat too dogmatic. I do not believe it is criminal if we do not wait, if the indication originally points to a cesarean section. In a case of contracted pelvis, I believe it is criminal to wait.

We have not recognized until recently that the cesarean operation was a last resort operation. After the patient has been in labor 100 hours, and so forth, after she is weakened and lowered in vitality, if a cesarean is made then, why wonder that there is a fatality? This operation is called a trachelolaparotomy. I can also look back over twenty years, and I cannot see from the method as illustrated where the cervix leaves off and the body of the uterus begins. Every cesarean section is a body operation. The indications for cesarean section are largely to gain more room and to get the baby out quickly. But as the method is described there is not enough room, and forceps must be applied to get the baby out. Years ago we were afraid of large incisions. We are going back to that in this operation. If the incision is large enough, the operation can be performed quickly; and if it is a last resort operation, it should be done as quickly as possible. A great deal has been said about a rise in temperature. How many normal deliveries happen without a rise of temperature? They are seen in every hospital. I agree with Dr. Holmes that with any technic, if developed, and if the indications are made out early enough, there is no more danger in doing a cesarean section than there is in doing a laparotomy for anything else.

DR. BERTHA VAN HOOSEN, Chicago: I am particularly interested in the importance that the authors and all of those who have discussed the subject have given to the temperature during convalescence. At the Cook County Hospital we had two patients side by side. On one I had performed a high cesarean section, on one day, and on the next day the resident surgeon performed a high cesarean section on the other patient. The patient on whom I operated had virtually no rise of temperature, and she felt fairly well; but she did not have as smooth a convalescence, as far as subjective symptoms were concerned, as the patient on whom the resident surgeon operated. But the temperature of the patient on whom the resident surgeon operated was 103, 104 and 105 F. virtually every day between the second and the twelfth or fourteenth. However, the sutures were removed the same day. Both wounds were in good condition and the two patients went home the same day, well. Why did one patient have so much fever and the other not? To me, it was very easily explained. Many years ago I learned at the Mayo Clinic that when sutures are put into the uterus when a myomectomy is performed, if they are tightened too much, there is increase of tension, and that will cause, during convalescence, a rise of temperature that will make the operator very uncomfortable but almost no one else. The patient will not be especially ill. I believe that young operators, those who are afraid of rupture of the uterus, and those who are naturally very careful in closing wounds will get so much tension on the uterine tissue that necrosis results. The amount of necrosis will determine the degree of temperature elevation. Although two or three layers of sutures were put into the uterus in the lower segment, I think it is virtually impossible to put in more than one, it is so thin. I regret that Dr. Cornell put in so many sutures because any one trying to follow him will try to put in those three layers. One can hardly put three layers of sutures in a cervix stretched out so that it is almost as thin as a piece of cambric. One can put in one suture very nicely and one probably will not get it quite as tight as if one put in three sutures in the high cesarean section. I have watched very carefully to see who of four of us would get the best results, whether from the high cesarean section, which I do, or the low cesarean section, which Dr. Hillis does, and I have decided that mortality does not prove anything. I think it is too bad to discard a low cesarean section on account of the mortality, or to say that it is superior to a high section. The last cesarean section I did on a patient who had meningitis. She had a general sinusitis which came from an infection of the middle ear. She was brought in unconscious. Just as soon as the diagnosis was made I did a cesarean section, not to save the woman, because I knew she would be dead in twenty-four hours, but as an aid to save the baby. The baby is alive today and in good condition. The mother died in twenty-four hours. The necropsy disclosed evidence of an infection which she could not have withstood. The cesarean section did not lessen her chances. It simply gave the baby a chance.

DR. JOSEPH L. BAER, Chicago: The only objection to classic cesarean section is the risk of peritoneal infection, in the exposed cases. I saw the old Latzko extraperitoneal cesarean section attempted six times in the course of five months in 1907. The operator nicked the peritoneum three times, so that in half his cases he defeated the object of the operation. However, that was at the beginning of his series. We are doing extraperitoneal sections in the infected cases at the Michael Reese Hospital. So far we have opened the peritoneum once in five times. There are various incisions. The skin may be incised along the outer border of the rectus or obliquely, as for inguinal hernia, but on a somewhat higher plane of the abdomen. Then, splitting through the external oblique and transversalis, the previously distended bladder is revealed and dislodged toward the median line, and then emptied. The fat is dislodged downward and laterally. The unopened peritoneal reflection is carried upward, and the lower uterine segment is exposed. The incision in the uterine wall is made as near the midline as the dislodgment of the bladder will permit; the nearer, the less hemorrhage from the lower branches of the uterine artery. The remainder of the operation is identical. Forceps are necessary to deliver the head through this opening. The favorable position for application, face anterior, is procured. To sum up: Extraperitoneal cesarean section is indicated in infected or exposed cases, in which group it affords security that no transperitoneal route can give. Its availability is limited to those cases in which the patient has been in labor long enough to pull the bladder up, and it cannot be used when haste is required, as the dissection and exposure takes time.

DR. E. L. CORNELL, Chicago: The ruptured uterus mentioned by Dr. King was a case in which the lower portion of the body of the uterus was opened, the rupture occurring in that section of the uterus. The incision is limited to the lower uterine segment. If the patient has been in labor, or if lightening has occurred, in the majority of cases, it is not difficult to distinguish between the lower uterine segment and the body of the uterus. The sections that were performed at the Chicago Lying-In Hospital were not performed by myself and Dr. De Lee alone. They were the entire series that have been performed at the hospital, which is an open institution. The cesarean section has been performed by many men. It was performed by us for other men. Most of these patients had vaginal examinations, forceps attempts, etc. The cesarean section then was done under conditions which are ordinarily considered adverse for any cesarean section, and the results that we quote are given with that idea in mind. Dr. Paddock was unfortunate in seeing one of the errors of technic. In our early work, in mine particularly, we did rupture or tear or cut the lower portion of the body of the uterus. This was not intentional. Later we were able to judge better—and practice makes perfect—so that we do not get into difficulties now. In the early cases the incision was not low enough or long enough. Occasionally, with a 10 or 11 pound baby, we do get an extension of the incision. It may tear around the lower end, but in the average case now we do not get any more tears. Dr. Gellhorn spoke about the incision going into the lower portion of the body of the uterus. This is not so as shown by our pictures of the technic. We do put the patients in the Trendelenburg position in most cases. More recently I have been operating in the flat position. I feel that we get equally good results. The forceps are applied because it is rather difficult to lift the head out of the false pelvis without putting the hands into the uterine cavity. This, we wish to avoid. I am under the impression that we do not have a rise of temperature in more than possibly 5 per cent. of the normal cases; that is, cases without vaginal examinations. Dr. Van Hoosen spoke about the three layers of sutures. The lower uterine segment, in the majority of cases, is about 1 cm. thick at the end of delivery. We put the first layer of sutures into the cervix, not including the mucous membrane. It includes only the muscle structure. The second row of sutures goes through

the top of the muscle and ties to the lower end. The third row is not in the uterus at all. It is in the uterine fascia, the fascia that lies between the bladder and the uterus. Dr. Baer spoke about the extraperitoneal operation. That is a good operation, but it is limited to a patient who has been in labor. We are doing the low cervical cesarean section in preference to the classical cesarean section at the present time, except in very large obese women. We do not do it then because of the difficulty of working through 4 or 5 inches of fat.

Dr. E. L. King, New Orleans: I want to stress the fact that this is simply a cross section of the work of twenty-five different men, covering the last twenty years. I wish to emphasize the need of teaching obstetrics so as to minimize the dangers of this operation. If we can get the contracted pelvis before it is contaminated, we shall have a lower mortality.

PROPHYLAXIS OF MALIGNANT GROWTHS OF THE MOUTH, FACE AND JAWS*

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Little more is known of the origin and nature of cancer than was known many years ago. Clinical considerations and experimental observations have accumulated which have enriched the literature of this subject, but the incidence of cancer increases. Although this is both appalling and true, there is, nevertheless, reason to believe that, out of the spirit of sacrifice and the genius of persistence of the laborers in this field of research, a solution will come eventually. The united efforts of pathologists, clinicians, statisticians and general practitioners will finally unravel the mystery of cancer, and probably through the study of the four factors of incidence, heredity, agency of transmission and pathology.

It is perhaps to the experiments of the laboratory that we look with the greatest confidence; but the clinical notations of the physician and surgeon who deal with cancer in man must be deemed of interest and importance.

Gully emphasizes the importance of researches outside the laboratories, believing that these may yield information of surprising interest, and perhaps of vital importance. Thus, he directs attention to the circumstance that the naked or almost naked races hardly know the disease, that it is rare in Egypt and India, and that our American Indians do not have it.

Why do not the naked races along the equator have cancer. What relation does vegetarian diet or the effects of the sun's rays or both bear to this apparently established fact? It cannot be denied that cancer abounds in the colder latitudes where the meateaters dwell and where sunshine is less constant and intense.

I have seen but one statement which would tend to destroy suspicion in this direction, and that relates to an observation that cancer is unknown within the arctic circle; and this statement, in view of necessarily meager researches, is perhaps open to doubt.

As a believer in the value of sun therapy, appreciating the bactericidal power of the sunlight and its great usefulness in the treatment of tuberculosis, syphilis, etc., one cannot consistently ignore the possibilities, in the way of beneficent results, of further investigations along this line with respect to cancer.

The long-known value of the sun's rays in the sterilization and healing of wounds and its importance in the prevention and cure of disease are still not sufficiently recognized. What relation the sun bears to the prevention of cancer only earnest unprejudiced study can determine.

Food may conceivably be a factor, and many scientific men have advanced this view. These views based on sporadic personal observations are perhaps indefinite enough to warrant us in refusing adherence to them; but no one who seeks the great truth of cancer prevention can afford to ignore them.

Hoffman says that cancer is more common among the well-to-do and ascribes its frequent incidence in this group to hypernutrition. Here one might fairly make the point that overfeeding among the rich is only one of many factors tending to lower the index of vital resistance. Excessive smoking, lack of physical exercise, worry and many devitalizing indulgences surely enter this consideration.

Ochsner is impressed by observations relating to the importance of raw vegetables in cancer dissemination, noting that the Japanese who eat raw vegetables in abundance suffer much from cancer, and that the inhabitants of India, who are obliged by their religion to boil their food, know little of cancer, especially of the intestinal tract. Cancer, when it occurs in Japan and in India, is largely confined to the chewers of the betel nut and the users of charcoal stoves.

Dr. William Mayo suspects that the more frequent incidence of cancer among inhabitants of the colder regions is due in part to the taking of hot foods, notably hot fluids. By others coal tar and coal smoke have been blamed.

Concerning the question as to whether the low rate of incidence of cancer in hot countries is due to the effect of the sun's rays or to abstinence from meat, it may be said in support of the latter possibility that, in herbivorous animals, when cancer occurs it is usually in the respiratory tract.

Syphilis is apparently established as a precursor of cancer. There is much evidence to justify this assumption, but after all it is merely an assumption. It would be as easy to show by statistics that syphilis provides immunity against cancer as it would be to prove a definite causal relationship between syphilis and cancer. For example, in Egypt cancer is almost unknown, yet syphilis, the "botch of Egypt," of the Bible, is widely prevalent. In the West Indies, where syphilis afflicts more than 90 per cent. of the inhabitants, one might expect to find cancer equally disseminated, but cancer is of only moderately frequent incidence here. One might explain these apparent paradoxes and adhere to the belief in syphilis as an etiologic factor in cancer by assuming that the hot sun and the vegetarianism of the semitropical regions offset the predisposition of the syphilitics to cancer; by assuming that the more frequent incidence of cancer in colder countries, less syphilized, is due to the greater prevalence and activity of other factors predisposing to cancer, such as hypernutrition, overwork and worry, or by assuming that, owing to the high death rate of syphilis in childhood, a comparatively small proportion of syphilitics reach the cancer age. However, there is, of course, no doubt as to the rather frequent development of cancer on the site of syphilitic lesions, as in the

* Read before the Section on Stomatology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

mouth. The interesting question here is whether the chronic inflammatory area of leukoplakia is more likely to become the site of cancer than is any other chronic sore of the mouth; for example, the granuloma at the tooth root, or the ulceration from pressure and irritation of a tobacco quid or a jagged tooth crown. This question is especially important in view of accumulating evidence that cancer bears a rather constant relation to inflammation.

That cancer is contagious in the ordinary meaning of this word is, I think, considered quite doubtful. However, of the fact of its inoculability there is no doubt, as is proved by animal experiments; and yet practicing surgeons will be disposed to wonder whether cancer is very readily inoculable in the human; for every one of us must have pricked a finger many times without local inoculation in the course of cancer operations, particularly before the day of rubber gloves; which seems strange in view of the high rate of incidence of cancer at the site of inoculation in animals, for example, by Fichera, Nuzum, Slye and others. Certainly, in view of the results of animal inoculation, one would not care to consult a dentist who does not sterilize his instruments and hands, if there be such a dentist.

The occurrence of cancer in plural instances in the same family, "cancer a deux" of married couples, cancer villages, cancer streets, etc., have long been looked on as strongly indicating heredity as a factor in cancer etiology. These observations, of course, do not establish the truth of heredity. Since the same village, street, or home often means the same habits, environment, occupation, etc., it is just as fair to seek the reason for cancer dissemination in the latter group of factors as in the former ones implying familial or other intimate connections. Mice experiments (for example, those of Slye) have given much stronger support to the hypothesis of heredity.

The question as to whether cancer is primarily of a local or constitutional nature is interesting to any one considering the matter of cancer prevention. L. Duncan Bulkley [1] has pointed out that, during the last 100 years, many famous surgeons, among them Abernethy, Sir Astley Cooper and Sir James Paget, have expressed the belief that cancer is a constitutional disease. Bulkley presents a chart setting forth laboratory findings and statistical, biochemical and clinical evidence in support of his contention. He stresses the importance of blood changes in early and late cancer, and of metabolic changes in the system before and after the development of the local cancerous lesion, and states that dozens of hundreds of patients with cancer have been benefited and cured by other than local measures.

Moreover, a recent writer [2] declares that cancer has never been proved to be a local disease at any stage and that it has never been proved not to be a constitutional disease at every stage. Now, if it were true that cancer is from the beginning a constitutional disease, then, of course, all of our efforts to lower the incidence of cancer of the mouth, jaws and face by the removal of jagged teeth, the cure of leukoplakia, or the interdiction of the pipe when, for example, the area of irritation appears on the lip, would be to little purpose; but every surgeon, out of his own experience, can recall at least several instances in which cancer has been ablated completely and permanently; for example, by the amputation of a hand or foot or removal of a lip; and such men will look with little favor on this view, even though it is held by so earnest and distinguished a man as Bulkley. Even those who refuse to admit that "if a man past middle life does not smoke heavily, nor chew tobacco, cares for his teeth and keeps his mouth clean, he is very much less likely to have cancer than one who does not follow the simple laws of mouth hygiene," will admit, at least, that such a man is less likely to have cancer of the mouth; and this is a matter of the greatest importance. Even admitting what is probably not true, that is, that cancer is primarily constitutional, it is, nevertheless, of tremendous importance to prevent its appearance in the mouth, since the history of the results of all forms of treatment of cancer of the buccal cavity constitutes a very dark chapter. This pitiable record shows its extreme malignancy, principally, of course, because of the richness of this zone in blood and lymph vessels and glands, and the intimate relation to vital structures.

That a lesion which is benign in its histologic nature may develop malignant character is no longer open to serious doubt. Paine believes that he has observed all stages and sequences of degeneration, from chronic inflammation of the breast to cancer. McCarthy's classification of chronic mastitis into primary, secondary and tertiary stages sets forth such sequence.

Clarke [3] believes that cancer results from inflammation when the process is prolonged beyond the regenerative power of the tissues; and Dr. C. H. Mayo has expressed the view that cancerous degeneration at the margin of the gastric ulcer may be due to exhaustion of the marginal cells, as a result of a long ineffectual attempt to cover the denuded area. Whatever the explanation, empiric proof is abundant to justify the long recognized principle of cancerous degeneration of benign lesions.

Naturally, in the region of the mouth, the dentist is the "master man in the struggle to combat malignancy." It is to him that we must look to give out the warning against danger of the early lesions of tobacco, alcohol, hot drinks, pyorrhea, syphilis, etc.

It is well established that cancer of the lip, mouth and tongue practically always attacks men who abuse tobacco, have jagged teeth, and ignore the dentist. As to lip cancer, the mere fact that 3,500 in round numbers die annually in this country from carcinoma of the lip, demands that interested attention be given to the matter of smoking. This, at the present time, concerns men as a rule, since lip cancer is six times more common in men than in women, lip cancer in women nearly always developing among pipe smokers. However, if the emancipation of American women in this respect becomes as complete as it is in Scandinavia, where ladies of perfectly apparent refinement smoke black cigars quite publicly, we may expect a higher rate of incidence of lip carcinoma among women.

Bloodgood,[4] speaking of tongue cancer says that there is always a warning sore spot, a white patch, or an area of irritation, and that examination and treatment at once protects from cancer. He further declares that the warnings of cancer of the tongue are definite and that in the beginning the lesions are not cancer. These warnings are white patches, bad teeth,

1. Bulkley, L. D.: Med. Rec. **114**: 85 (July 20) 1921.
2. Little, S. W.: Med. Rec. **100**: 407 (Sept. 3) 1921.
3. Clarke, T. C.: Lancet **2**: 1298 (Dec. 25) 1920.
4. Bloodgood, J. C.: Cancer of the Tongue: A Preventable Disease, J. A. M. A. **77**: 1381 (Oct. 29) 1921.

areas of irritation and ulcers. The same is, of course, true of cancer of the lip, gums and mouth generally.

As an indication of the excellent results accomplished by the educational campaign of the American Society for the Control of Cancer, it is noted by Bloodgood that one of the large surgical clinics of this country has just completed a study of about 265 cases of areas of the tongue that were cancerous and of areas that were not cancerous. In the first decade, up to 1900, but one person (3 per cent. of the total number) consulted this clinic for a sore on the tongue which was not cancerous. In the third decade, from 1910 to 1920, seventy-one persons, or 48 per cent., came for advice before cancer had started. Since the beginning of the fourth decade, nineteen men, or 55 per cent., have, because of the educational movement, come under observation before cancer had started.

Therefore, of 265 men who thought they had cancer of the tongue, in 105, or 40 per cent., protection from cancer has been accomplished by the dissemination of information only.

Little [4] assumes that cancer is a constitutional disease in the same sense that premature old age is a constitutional disease, and suspects that it may be controlled by the same means; but he does not deny that chronic irritations are the usual sites for the appearance of cancer and concedes, after an interesting review of statistics, that smoking is almost a prerequisite for the appearance of cancer of the lip.

It is, of course, our plain duty to encourage every effort to discover the nature and ultimate cause of cancer; but, in the meantime, no dentist or physician can justify himself in ignoring such an abundantly proven clinical or empiric fact that a man of middle age in whose mouth a quid of scrap tobacco rides habitually on a row of jagged molars, is courting disaster, regardless of theories as to whether cancer is primarily constitutional.

It is the work of such organizations as the Society for the Control of Cancer which is most productive of good results in the battle against this scourge. I believe that if almost any one of the men so actively and earnestly engaged in this field were asked to sum up in a single word everything that relates to our present day knowledge of cancer prevention, the one word would be "education," and although my views may be to some extent influenced by personal bias, I believe that this education should consist largely in teaching all those in middle life to exercise abundantly in the fresh air, to live in the sunshine and to subsist on a diet of fruits and vegetables as nearly as a sensible person can; and, moreover, to be sure that the foods are cooked and not eaten too hot.

That overeating is not only disgusting but dangerous should be taught, and that overwork and worry lower the index of vital resistance against cancer as well as arteriosclerosis. We should keep happy, employing the carefree philosophy of the negro, whose cancer incidence is low. We should not smoke much, or ever use a pipe, or chew tobacco.

Further education is necessary to impress physicians and the laity with the importance of recognizing precancer lesions of the skin and mucous membranes, especially when there is transition of epithelium, and dealing with them promptly. Finally, all must be taught that there is no health measure more important than rigid mouth hygiene, which, after all, means to employ a good dentist and to obey him to the letter.

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TEACHING THE FUNDAMENTALS OF SURGERY

FROM THE POINT OF VIEW OF THE GRADUATE SCHOOL *

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The Committee on Graduate Instruction in Orthopedic Surgery appointed by the Council on Education of the American Medical Association last year made certain fundamental suggestions concerning the training of orthopedic surgeons. The first paragraph of that report [1] is as follows: "This committee takes the position at the outset that orthopedic surgery is a branch of general surgery and that no preparation for the practice of orthopedic surgery can be considered satisfactory which does not comprise adequate practical training in the principles and technic of general surgery." This wise resolution no doubt explains why the chairman has asked me to talk on "the teaching of surgery" rather than on "the teaching of orthopedic surgery." What I have to say will relate to unorganized graduate medical training, to our experience in organized graduate work in the University of Minnesota, and to the lessons which may be drawn from that experience.

UNORGANIZED TRAINING

Unorganized graduate training in surgery and other special fields of medicine is, of course, no new thing. In this country, until recent years, most of it has been accomplished in internships, residencies, assistantships and apprenticeships, supplemented in some instances by short courses in so-called postgraduate schools either here or abroad, by visits to other clinics, and so forth. We must not forget that this unorganized, somewhat hit-or-miss system has been the chief factor in the development of the present-day leaders in all the special fields of medicine. It has many advantages, especially in that it permits the greatest freedom of choice on the part of the graduate student who desires to fit himself for practice in a special branch. Some of its disadvantages are:

1. The system is liable to waste the time of the graduate student. This ill-spent time apparently averaged more than a year for each of 217 leaders in special clinical fields who responded to questionnaires of the Committee on Graduate Medical Education of the American Medical Association two years ago.[2]

2. Students in surgery, when left to their own devices, are liable to strive for technical training before they have grasped the essential relationships of pathology, or have attained sufficient skill in surgical diagnosis. Even their technical training may be too narrow to produce broad-gage surgeons or orthopedists.

3. Interns, residents and assistants are too often selected from among the graduates of the school with which the hospital is connected. These young men, without experience elsewhere, may acquire only very provincial points of view and are liable, in turn, to become members of their medical school faculty. The result of this inbreeding has already shown itself, in some medical faculties, in early professional paresis.

* Read before the Session on Orthopedic Surgery at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. A. M. A. Bull. **15**: 49-50 (January) 1921.
2. A. M. A. Bull. **14**: 45-49 (July) 1920.

4. The failure of universities in the past to recognize by higher degrees standard attainments in special medical fields has resulted in the attempt to remedy this by such organizations as the American College of Surgeons and the American College of Physicians, which, though actuated by the best of intentions, must labor under great difficulties in any attempt to standardize large numbers of widely scattered applicants, of whose actual attainments they can have only the most superficial knowledge.

MINNESOTA'S EXPERIENCE

With some realization of the above-mentioned difficulties in unorganized graduate medical training, the University of Minnesota, seven years ago, undertook to reorganize the opportunities in its laboratories and university-controlled hospitals in Minneapolis and St. Paul, and in the laboratories and hospitals of the Mayo Clinic in Rochester, Minn., into a system which would provide means for selected graduate students, under advice of a competent faculty, to round out any existing weak points in their previous medical training and to fit themselves, on a broad educational basis, for practice in special clinical fields, including surgery and orthopedic surgery. Accordingly, a plan for graduate medical education, which, in general, follows that in operation in many universities for graduate work in the liberal arts and the other sciences, was formulated, and has been in operation since Jan. 1, 1915. Selected graduates of Class A medical schools who have had at least one year of graduate internship or laboratory work are accepted for periods of from three to five years of graduate work in a specific field. Our seven years' experience, so far as statistics go, may be summarized thus:

At present, more than 1,000 prospective candidates a year are seeking opportunities for graduate medical training in the Mayo Foundation, which is one division of the medical graduate department of the graduate school of the University of Minnesota. Of these, about 60 per cent. are inquiring for work in general surgery. Almost all of the remainder are seeking opportunities in other clinical fields. An exceedingly small number are seeking opportunities in the preclinical branches.

Of the 1,000 prospective students a year, many are discouraged at the outset by the small number of vacancies in fellowships available, by the long period of work required, or by the stringent educational requirements for entrance and graduation. However, about 200 a year do complete their formal applications for a three to five year service, including submission of their credentials, references and so forth. In all, 1,005 such complete formal applications have been filed in the Mayo Foundation. A careful analysis of these applications shows that 778 candidates were eligible and 227 ineligible for admission under the rules of the university. Four hundred and eighteen students have been accepted, of whom 184 have selected surgery and eight orthopedic surgery as their major field. All students in orthopedic surgery have, of course, taken work in general surgery, and many students in general surgery have had special work in orthopedic surgery. Hence, it is proper to consider these two groups together. Of these 192 students in surgery, seventy-two are either now on duty in the Mayo Foundation or have been appointed for service during 1922. Twenty-four students in surgery were permitted to resign during the first year of their fellowship, seventeen during the second year, and forty-two during the third year or later, without having attempted to meet the final requirements for advanced degrees. Five more are now on leave of absence. Up to the present time, including the graduating class for June, 1922, thirty-seven candidates have attempted to meet the final requirements for advanced degrees in surgery. Of these, thirty-one have been granted the degree of master of science in surgery, two the degree of doctor of philosophy in surgery, and four applicants have failed to meet the requirements for any advanced degree in surgery.

These facts and certain others which may be of interest concerning other fields will be found in the accompanying table.

Our experience during the last seven years, in interviewing and corresponding with several thousand prospective graduate medical students and in working daily with the four hundred who have been with us, has led us to make certain observations concerning the previous training of the applicants, the various means of giving those who are accepted opportunities of becoming competent in their chosen fields, and the means of testing their attainments.

GRADUATE STUDENTS IN THE MAYO FOUNDATION FROM JAN. 1, 1915, TO MAY 16, 1922

Major Field	Graduate Students Now on Duty or Appointed July 1, 1922	Left During First Year of Fellowship	Left During Second Year of Fellowship	Left During Third Year or Later, Not Candidates for Degrees	On Leave of Absence	Applied for Degrees	Received M.S. Degree	Received Ph.D. Degree	Failed	Total Number Graduate Students (Duplicates Omitted)	Additional Eligible Applicants Not Accepted	Total Eligible Applicants	Ineligible Applicants	Total Completed Applications
General surgery	65	24	17	41	5	36	30	2	4	184	246	430	148	578
Orthopedic surgery	6	..	..	1	..	1	1	..	..	8	5	13	3	16
Urology	6	3	4	2	1	5	5	..	..	20	8	28	7	35
Ophthalmology	4	6	1	1	..	..	..	..	..	12	2	14	5	19
E., E., N. & T.	..	..	..	..	..	..	..	..	..	..	6	6	15	21
Otolaryngology	10	2	5	1	1	2	2	..	..	20	6	26	5	31
Medicine	47	9	3	5	2	7	5	1	1	72	42	114	30	144
Dermatology	6	2	..	..	1	1	1	..	..	9	4	13	..	13
Pediatrics	3	2	..	..	..	..	..	..	..	5	3	8	2	10
Neurology	4	..	..	..	..	..	..	..	..	4	3	7	..	7
Roentgenology	5	2	..	..	..	..	..	..	..	7	4	11	4	15
Pathology	9	4	2	..	..	5	4	1	..	18	7	25	5	30
Bacteriology	1	1	1	2	..	2	1	1	..	7	10	17	..	17
Chemistry	3	2	1*	..	..	1	1	..	..	6	4	10	..	10
Physiology	..	..	..	..	..	..	..	..	..	..	2	2	..	2
Dental surgery	9	2	1	..	..	..	..	..	..	12	8	20	3	23
Total	178	59	35	53	10	60	50	5	5	384	360	744	227	971
Short term†	1	33	..	..	..	..	..	..	..	34	..	34	..	34
Total	179	92	35	53	10	60	50	5	5	418	360	778	227	1,005

* Died.
† Medical officers from the United States services, fellows from other universities, appointees of foreign governments, et al. Does not include undergraduate volunteer summer students.

DEFECTS IN PREVIOUS TRAINING

1. Applicants for fellowships average about 27 years of age at the completion of their internship, which averages about one and one-fourth years. This is obviously too old. Allowing eight years for college, medical school and internship, their average age at leaving high school was about 19 years. From personal interviews with hundreds of applicants, I am convinced that their retardation usually has been in the high school, and there almost always through difficulty with algebra, geometry and foreign languages. All of these studies, I believe, are customarily begun after the passing of the optimum psychologic period for their acquisition. I doubt very much whether 8 years of age is too early to begin the study of modern foreign languages, and I believe that every day after 12 years of age that such study is postponed adds an unnecessary burden to the student. There is no question that a child of 12 can readily grasp the fundamental principles of geometry and algebra. The postponement of the teaching of the principles of these until arithmetic is nominally mastered is an error which results in unnecessary hardship for the student in later years.

2. Very few applicants have a real reading knowledge of French or German despite the fact that they have nominally met the Class A medical school requirements in this respect. This is the result of bad teaching of the languages and the failure of medical school faculties to see that the medical student is required to persist in his reading of foreign medical literature.

3. Many applicants use incorrect spoken and written English. Many of them apparently have little knowledge of those subjects which contribute to good citizenship and personal culture, such as history, economics, literature, art and music. Defects in these probably may be charged to their homes as much as to their schools.

One cannot help believing that all such defects might be readily remedied. Attention in the home to the use of correct English, to the reading of good books rather than sloppy juveniles, to training in habits of industry, persistence, promptness, honesty and courtesy should lay the foundation. If, then, the grade and high schools would provide, for those whose parents desired it, instruction in algebra, geometry and foreign languages, at the period when these can best be learned, it should be possible for most boys and girls to enter college at 16 years of age. Added to this, a four-year college course which includes at least as much study of the humanities as of physics, chemistry and biology, should bring the 20-year-old college graduate to the portal of the medical course, not only with more culture than he has at present, but also with much more ability to evaluate and assimilate the important portions of the several preclinical medical sciences with which he is deluged during his first two years in medical school.

The attempt to teach, in the first two years of medical school, six complete medical sciences, any one of which would require the full attention of the medical student for at least two years were he fully to grasp the subject, is probably responsible for the next defect to be mentioned.

4. Many applicants have but a very superficial knowledge of anatomy, biochemistry, physiology, pathology, bacteriology and pharmacy. Their knowledge of essentials is as superficial as their knowledge of unessentials in these subjects.

We must either double the time now allotted to the teaching of the preclinical medical sciences or halve the amount of subject matter in each which we attempt to teach if we are to approach necessary thoroughness in the essentials of each.

5. Many present day graduates are at a loss to apply what they do know of the essential principles of the preclinical branches in the diagnosis and treatment of disease. Unfortunately, the attitude seems to exist to some extent that, at the end of the first two years in the medical school, when the examinations in anatomy, pathology, chemistry, physiology, bacteriology and pharmacology have been taken and passed, the student is through with these subjects for the rest of his life, and, now that he is no longer to be bothered with them, he may give his attention to the really interesting fields of clinical medicine. This attitude is so pronounced that there is a strong tendency in the last two years of medical school and during internship to permit the student to fail to apply his knowledge of the fundamental facts of the preclinical branches in his study of the diagnosis and treatment of disease.

The physician who has a sufficiently thorough knowledge of the essentials of the fundamental medical sciences to use them as familiar tools in the every-day study of complicated individual cases, and who threads on these lines of knowledge his careful clinical observations, until he can reach a correct diagnosis and formulate a logical plan of treatment, is unfortunately getting rarer, and his production, we believe, is not favored by the present cramming system in our medical schools.

SELECTION OF FELLOWS

However, with all his defects, the present day applicant for graduate medical training is usually a likable and enthusiastic chap. On the assumption that the limited opportunities for high grade graduate training should be given only to high grade students most likely to profit by them, how shall we determine whether a certain applicant really has the makings of a real surgeon within him? A large number of young medical students think they have such ability. They are attracted toward surgery because it is the spectacular side of medicine. They feel that they have a "call" to surgery. This insistence of a "call" on their part we should not take too seriously. Dogs of almost every breed will hesitate or stop at the sight of a wild animal; but if we mistake this common hesitation for pointing, and try to train a bulldog for hunting prairie chickens or quail, we waste our time. Similarly, if we try to train every medical student who thinks he is a born surgeon, we will waste our time, his time, the patient's time and, occasionally, the patient's life. For this reason, I doubt whether courses in the graduate school leading to the study of special fields in medicine should be thrown open unqualifiedly to every student who is able to pay a tuition fee. While the judgment of faculties may be poor, they are in the long run probably much better than the ungaged desires of the average medical student who seeks admission to a graduate school for the purpose of becoming a surgeon. In making selections, however, we must not be guided entirely by scholarship as recorded in the medical school and college. We must look for evidence of broader scholarship than these institutions now furnish. True, his scholarship in medical school should have been at least sufficient to place the candidate in the upper third of his class. But, most of all, we should try to get some estimate of the appli-

cant's character. Unless he shows in his personal appearance, in his manner with his associates, in his manner with patients (especially poor patients), in his general demeanor, in his honesty, his loyalty, and in his manner of receiving criticism that he is at heart a courteous gentleman, he should not be encouraged to enter an already overcrowded field of medicine. If, in addition to these qualifications, he has ambition, initiative, industry, persistence and promptness, he is worthy of careful consideration for training.

The candidate having been selected and means provided, either from his own funds or from private benefaction, for him to continue his special study for a period of not less than three years and preferably five, how shall his time be spent?

SERVICES IN WHICH THE CANDIDATE SHOULD BE TRAINED

Necropsy Service.—At the beginning, something must be done to attempt to patch up the defects in his previous training. Not all of this patching can be done at once, nor should it be. It is better to distribute repairs as required throughout his three to five years of training. One important phase of his education has been almost always neglected in American schools: He has not had his hands in more than half a dozen necropsies. I firmly believe that no man should be permitted to operate on the living until he has operated on at least 100 dead. Our first duty, then, if possible, is to place the embryo surgeon where he can make a start in necropsy work, which, if he is to be successful, he will need to follow out for the remainder of his professional life.

At the necropsy, the student should actually make the section, beginning first as junior, acting as assistant, and later as senior, making the postmortem. All of this work should be done under the eye of a competent pathologist, who, as a measure of restraint, may need to tie his own hands behind his back. The instructor must remember, however, that the embryo surgeon had better make errors on the dead than on the living. How a sufficiently large necropsy service is to be developed even in large hospitals is, I believe, merely a question of going after permissions in a straightforward but persistent manner. Time and time again, we have had demonstrations in the United States that, if we want postmortems, we can get them. No hospital should be satisfied with performing necropsies on less than 75 per cent. of the bodies of all patients that die. Friends of the dead have as much right to demand this service as the profession has to request permission to render it.

The percentage of postmortems in an institution and the character of and attendance on clinical pathologic conferences are perhaps the surest index of the scientific work of the institution.

Diagnostic Service.—After the necropsy service, the next in which the graduate student should be placed is the diagnosis of disease. Here, under constant competent supervision, the graduate student should have an opportunity to take histories, make the simpler laboratory examinations and designate more complicated ones for all classes of patients. The service should not be confined to cases that have already been separated into medical and surgical. The entire "grist" should be seen. In this work, the most important point to be looked out for by the instructor is that the graduate student shall be compelled, in his analyses of cases, to give his reasons in terms of anatomy, physiology, pathology, and so forth, that he may have constantly before him the necessity for applying the principles of these subjects in his interpretation of clinical phenomena and in his final summary or diagnosis. Throughout this work and all of his subsequent work, the graduate student should be expected to attend necropsies on, at least, those patients with whom he has come in contact, and all clinical-pathologic conferences occurring in the institution.

Operative Service.—After not less than one year of this service, the embryo surgeon may be placed on duty as second assistant in the operating room, where his duties include the hospital preparation of patients for operation, his ordinary duties as second assistant, and the postoperative care of patients.

As soon as his skill has sufficiently developed, which should be in not less than six months, and ordinarily at the end of one year, he should be given a first assistantship. In our experience in the Mayo Clinic, these first assistantships are of most value to the student if they extend for a period of not less than one year under the same chief surgeon. Fellows may be reappointed for a second year. The student's service here may include duties outside the operating room similar to those he had as second assistant, and, in addition, he becomes to some extent responsible for the training of his junior. As soon as he gives evidence of sufficient ability, he should be given opportunity to act as chief surgeon at operations, while the surgeon actually in charge stands by and sees that he does his work properly and that no harm comes to the patient.

The work as thus outlined represents the principal opportunities for study which should be provided for the graduate student in surgery. Nothing has been said about class work, lectures, quizzes, examinations, theses, degrees and so forth. However, these all enter in their proper place.

OTHER OPPORTUNITIES FOR STUDY

Lectures.—I very much doubt the value of the formal routine lecture course for graduate medical students. Its purpose may be better served by proper guidance in suggestive reading courses, in clinical conferences or seminars held not less frequently than once a week, and in inspiring lectures from outside men who have done special pieces of work and who may be induced to come and deliver lectures concerning it.

Seminars.—The seminar or clinical conference provides the best opportunity for teaching graduate medical students. This is not so when the professor in charge does all the talking. His function should be to answer questions rather than ask them; to stimulate discussion rather than to dominate it. In other words, he should encourage his young men to form opinions and to express them, thus giving him an opportunity for kindly criticism. The spirit of the seminar should be one of cooperative study rather than of master and pupil. The seminar and conference should be held at a definite period of from one to two hours, not less than once a week throughout the entire course.

Quizzes.—How shall we know whether the graduate is making real progress? Principally, by intimate, daily intercourse with him. It is desirable, when men are admitted from many different institutions, in order to test the efficiency of one's standard of admission, and to be sure that the men selected really have some knowledge of those principles of fundamental medical sciences which underlie clinical medicine, to give an examination to each man early in the course. This examination, preferably, should be oral and should be

taken part in by from three to five members of the faculty, most of whom should be clinicians, who should quiz the candidate very thoroughly, yet avoid all questions except those designed to determine whether he has knowledge of the absolutely essential principles in the fundamental medical sciences. The candidate who is found not to have such knowledge should not be permitted to continue with his work. It is not the place of the graduate school to teach the elements of preclinical branches, but to give opportunity for the daily use of these elements.

Course Records.—That some record may be kept of the work of the graduate student, it is necessary that the faculty member with whom he is working shall make a report from time to time, preferably at the end of each quarter, of his work in all respects. This report should be confidential to the dean of the school and should cover not only an estimate of the details of his diagnostic and operative skill but also of his general training and his personal characteristics. Such a rating sheet, which has been in use in the Mayo Foundation and previously in the Mayo Clinic for a number of years, is presented herewith:

UNIVERSITY OF MINNESOTA GRADUATE SCHOOL OF MEDICINE

Confidential report on.....Fellow / Scholar / Associate in THE MAYO FOUNDATION
in Course No..... with Assistant Professor.....
from.....to..... Major:..... Minor:.....

NOTE—Students will be graded: A, B, C, D, or E on each numbered point on which it is possible for the instructor to form an estimate. A represents the highest possible grade and E the lowest short of complete failure. The "General grade for work of Course" will be marked as are the numbered points; or, if the student's work has been a failure, it will be marked F (failure); or, if the student has been too brief a time with the instructor to warrant giving him a grade, this item will be marked I (incomplete).

PERSONAL CHARACTERISTICS:
1. Personal appearance.....
2. Manner with associates.....
3. Manner with patients.....
4. General demeanor.....
5. Ambition .....
6. Initiative .....
7. Industry .....
8. Persistence .....
9. Promptness .....
10. Honesty .....
11. Loyalty .....
12. Reception of criticism.....

TRAINING—GENERAL:
13. General intelligence.....
14. Use of oral English.....
15. Use of written English.....
16. Chirography .....
17. General medical training....
18. Knowledge of anatomy.....
19. Knowledge of physiology....
20. Knowledge of pathology....
21. Knowledge of medical ethics
22. Comprehension of instructions .....
23. Faithfulness in carrying out instructions .....
24. System in work.....

DIAGNOSTIC:
25. Skill in history-taking.....
26. Skill in physical examinations .....
27. Thoroughness in physical examinations .....
28. Judgment in referring patients for special examinations .....
29. Judgment in interpreting results of special examinations .....
30. Judgment in summarizing cases .....

OPERATIVE:
31. Quickness of vision.....
32. Knowledge of and faithfulness in asepsis.....
33. Manual dexterity .....
34. Ability to meet emergencies
35. Care of postoperative cases..

GENERAL GRADE FOR WORK OF COURSE.....

On the basis of the work which the student has done under your instruction, would you recommend him for reappointment at the end of his current Fellowship year?.....

Would you recommend that he change his Major?....If so, to what?..

Would you recommend that he be asked to resign before the end of his current year?.....

General Remarks .....
.....
.....
.....

Date..... Signed.....

If the ordinary university grades of A, B, C, D, and so forth, are used, it is a good rule that no student receiving a grade below that of B shall receive credit toward his degree for the work so graded. It would seem to be a fair rule also that any student receiving for two consecutive periods a general grade of D or lower should be requested to leave the institution. Opportunities for grade study of medicine on a university basis are altogether too few in this country to warrant their being wasted on mediocre and inferior men.

Examinations.—Since our present system of licensing practitioners in the various states of the United States is based entirely on examinations, we are under the necessity of giving examinations to graduate students if we are to send them out from the university with the university stamp on them. As a result, all graduate students who are candidates for degrees from the university should take examinations, both oral and written, and these should be more severe in the fields of the candidate's major and minor subjects than he is ever going to get anywhere else.

STANDARD FOR DEGREES

Aside from a satisfactory residence of a definite period, which should be from three to five years for the graduate study of surgery, a satisfactory record of which has been filed at definite intervals, and aside from the passing of the examinations herein suggested, what other requirements should be made of a prospective candidate for a graduate degree in surgery from a university before he may be properly recommended for that degree? In the first place, it appears that he must be competent in his field; in other words, he must be an "honest-to-goodness" surgeon. The only way this can be determined as a matter of record is on certificate from the surgeons with whom he has worked that, in an emergency, they would be willing to send members of their own families to him for diagnosis and surgical treatment. If they are not willing to certify to the candidate's competence to this extent, the university should not grant him an advanced degree in surgery, since the granting of this degree will stamp the candidate as a surgeon competent to care for citizens of the state.

A further qualification should be that the candidate has shown that he has a scientifically trained mind, that he is capable of analyzing and synthesizing his own observations, either clinical or experimental, or both, comparing them with those of other men doing similar work, and drawing logical conclusions therefrom. Though in many respects unsatisfactory, the production of a thesis which embodies such an analysis is perhaps the best means we have for the candidate to demonstrate his scientific ability in this respect.

One of the most important services that an institution should provide is that of careful revision by members of the faculty of all articles written by graduate students. Besides this criticism for truthfulness, accuracy, clearness and so forth, they should be given careful editing by a competent editor, who will then laboriously explain to the writer the reasons for the changes made. The state of our medical literature at present is most deplorable. It will not be better until we give it more thorough and more constant attention. The undergraduate medical schools should do this work; the graduate medical schools must do it.

SUMMARY

The graduate of a Class A school who has had a minimum of one year's internship in a general hospital, who has had from three to five years' opportunity for graduate work in surgery, which has included at least six months of necropsy service, one year of diagnostic service, and one and a half or, better, two and a half

years of operative service, during all three of which services he has had constantly before him the necessity for using daily the essential underlying principles of anatomy, physiology, chemistry, pathology, bacteriology and pharmacology, until they have become to him absolutely familiar tools for the diagnosis and treatment of disease, who is above all a competent surgeon, who has passed more severe examinations in the field of surgery than he will ever be obliged to pass elsewhere, and who has prepared and defended a thesis of the character indicated, may properly be recommended for the degree of master of science in surgery or master of science in orthopedic surgery, as the case may be, to be granted by a properly constituted university of which the medical school is a part.

Besides the foregoing, it sometimes happens, though unfortunately not often, that a graduate medical student shows that he has real research ability and demonstrates this beyond peradventure by making an actual contribution of considerable import to medical science. For such a student, there should be reserved the degree of doctor of philosophy in surgery or orthopedic surgery. Of course, in addition to the requirements outlined for the master of science degree, he should fulfil also those other minor conditions, particularly in relation to foreign languages, which are ordinarily required by universities of candidates for the degree of doctor of philosophy in other fields.

CONCLUSIONS

I wish to urge the importance of graduate work in surgery, orthopedic surgery, or any other specialty, being done in institutions where work in other fields of medicine is going on at the same time. Isolation, in the long run, is a serious handicap. The daily association of men who are engaged in other fields, the discussions with them in informal conferences and, especially, the frank criticisms of each other in staff meetings at which are read the articles which are the results of scientific study in the institution, all conduce to a much broader view of a specialty and to the making of much broader men who are to practice in the specialty.

ABSTRACT OF DISCUSSION

DR. DEAN LEWIS, Chicago: The training of the surgeon is a timely but rather large subject for discussion. It seems rather a reflection upon surgeons that a pathologist should apparently consider it necessary and eminently fitting that he should outline the courses of graduate instruction necessary to make a well rounded surgeon and then pass upon his qualifications. Dr. Wilson has discussed the graduate training and as this rests upon a sound and sufficient undergraduate training, I consider that I shall not be digressing from the discussion if I mention some of the things in undergraduate work which are necessary to the proper training of a surgeon. In the first place men graduate too late in medicine. They should graduate much earlier so that they may devote their early productive years in concentrated effort upon the work which they choose to follow. The second feature which militates against good training is the lack of cooperation of departments and coordination of teaching. It should be possible to establish a curriculum which will give the best preparation, but this will never be possible until department heads are willing to sacrifice for the common good. The curriculum and methods of instruction in vogue today are of the spoon feeding type. There is too little effort made in the development of critical analytic ability and to discourage the acceptance of any dogma laid down notwithstanding insufficient data upon which deductions are made. We constantly hear about the teaching of principles. If a student in surgery had spent a few hours in this section yesterday afternoon, I do not believe that he would have been able to unravel the skein of principles involved in the treatment of fractures. It is not so long ago that the operative treatment of fractures threw into the discard most of the thoroughly established principles of the treatment of fractures which are just now being rescued. This merely shows how enthusiasm and propaganda can overthrow old established principles. It is difficult to say how the sound principles of surgery can be preserved when enthusiasm unchecked by critical ability and sound reasoning is rampant. No one denies the necessity of a sound pathologic training, but how to stimulate the student in the study of pathology is a great question. I would make the surgeon an excellent diagnostician, an expert pathologist, a good physiologist and an expert and sound operator. This is a difficult thing to do and it requires years of preparation. A man must be an idealist to secure the training necessary to fit him for the practice of surgery, and he is often discouraged in finding that he is handicapped in the competition, discovering frequently that surgery is sold to the highest bidder. Fee splitting interferes more with the training of the surgeon than the limitations of the students or the imperfections of our medical schools and clinics.

DESENSITIZATION OF HAY-FEVER PATIENTS BY INJECTION AND LOCAL APPLICATION*

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TORONTO

The localized desensitization which may take place after one has produced a reaction in testing a patient against pollens or proteins has been outlined by MacKenzie and Baldwin.[1] Their preliminary experiments showed the degree and duration of the cutaneous exhaustion which might follow an initial test. At this time they anticipated "the probability that by local application of pollen or dandruff extracts to the mucous membrane of the nose and throat of patients with allergic rhinitis the reactivity might here also be abolished."

The observation on my part, that specific cutaneous sensitization might disappear over night from a very considerable part of the same forearm which previously had been tested and found positive, led me to consider the possibilities of applying therapeutically the principles underlying the phenomenon. This change in local reactivity was drawn to my attention by the more or less routine testing of both bronchial asthmatic and hay-fever patients, and was not followed up by a series of carefully controlled experiments such as were made by MacKenzie and Baldwin.

In selecting ragweed as the particular pollen with which to try local application, I was influenced by the fact that it is with the ragweed-positive cases that one experiences the greatest difficulty in obtaining satisfactory desensitization and freedom from clinical symptoms. The possibility of further influencing the reactivity of the mucosa by utilizing local application as well as by subcutaneous injection would appear to be the logical basis on which one would expect the

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* Read before Ontario Medical Association, June 1, 1922.

* From the Research Division of the Connaught Antitoxin Laboratories, University of Toronto.

1. MacKenzie, G. M., and Baldwin, L. B.: Observations on the Specific Exhaustion of Cutaneous Reactions, Proc. Soc. Exper. Biol. & Med. **18**: 214, 1921; Local Desensitization in Hay-Fever Individuals and Its Bearing on the Prevention of Hay-Fever, Arch. Int. Med. **28**: 722 (Dec.) 1921. MacKenzie, G. M.: Desensitization of Hay-Fever Patients by Specific Local Applications, J. A. M. A. **78**: 787 (March 18) 1922.

clinical results to be associated. In this connection it is to be remembered, however, that patients may show after successful subcutaneous treatment either positive or negative cutaneous sensitization to the pollen or protein against which they have been injected. In any event, the data which might be obtained from locally applying the antigen to the mucosa seemed sufficient to justify its trial on general, as well as on therapeutic grounds.

The introductory references to the literature by MacKenzie [2] are so similar to those which had appealed to me as relative to the subject that I feel I may omit this aspect beyond perhaps drawing attention to the observations by Besredka [3] that the introduction of antigen through the upper respiratory tract is a satisfactory means of inducing immunity, and that through this channel also it is possible to induce anaphylactic shock in properly sensitized guinea-pigs. Parker's [4] demonstration that ragweed has true antigenic properties seemed to favor the selection of this pollen for the evaluation of local application and for any further work which might be suggested by the observations attendant on its application locally.

The groups of patients summarized in Table 1 suffered from seasonal hay-fever; they were tested and found positive to different pollens which, in view of the seasonal character of their symptoms, afforded reasonably certain evidence that their symptoms were due to pollen sensitization. In estimating the number of seasons involved, previous experiences were disregarded unless the pollens indicated by such past experiences gave positive reactions. Patients will not infrequently state that previously they suffered from symptoms which began in early summer and continued till the late autumn, but that latterly symptoms had begun only with the onset of the autumnal variety; the reverse of this, namely, an increase in the seasonal duration of symptoms, is perhaps as frequent.

The cases taken for analysis include all those treated except (1) a few who have failed to reply to inquiries regarding the results experienced, and (2) a number whose injections were far too few to warrant any conclusion being drawn therefrom. A certain number have been included to whom the full course of treatment was not given, because they either began too late or were absent during periods of their treatment. A rigid adherence to only those who had taken a full course previous to the approximate date of onset would exclude a number who experienced very satisfactory results.

Local application was made by inunction, the ragweed pollen being ground up (mechanically), and quantitatively mixed with phenolated petrolatum in dilutions [5] of 1:2, 1:20 and 1:200. Each dilution was put up in collapsible tubes, and applied by expressing a convenient volume on the little finger of the patient, and thoroughly rubbing into the nasal mucosa.

MacKenzie obtained local application by spraying the mucosa. While this would seem to have the advantage of reaching a greater area, a number of small considerations led me to select inunction. The dose was increased by mixing varying proportions of two strengths on the finger in advancing from the first application of the 1:20 strength to that of the 1:2 strength, for example.

METHOD OF GENERAL AND LOCAL DOSAGE

Injection [6] was given twice weekly except in the few instances in which the local reactions [7] were sufficiently severe to warrant a temporary postponement. During the prophylactic treatment the inunctions were made in nearly all cases at the time the injection was given: in a few the inunction was made by the patient at home a day or so following the subcutaneous treatment. The preseasonal treatment was, as far as possible, planned so that the full course would be finished sometime during the week or ten days following the date of onset of the patient's seasonal type. In suitable cases after the completion of the injections, tubes of the 1:2 strength of ointment were given to the patient for a limited continuance of local application. The number of pollens against which desensitization was attempted in each case is shown in Table 1. The factors on which this was decided were the degree and relative sensitization, as shown by the cutaneous tests, the history of seasonal symptoms, and the time available for treatment. The frequent absence of relative cutaneous sensitization, as exhibited by different patients, between, for instance, the various grasses used in testing, and among these the occasional absence of a positive test to either timothy or red top pollen, has led me to believe that treatment on the assumption of group reaction will not be as satisfactory as treatment based on the tests, repeated preferably during the season of attack. This conclusion is supported, among others, by Watson and Kibler.[8]

In planning early in 1921 a trial of local application, I had intended to use alternate cases so that afterward the results could be compared with those obtained by injection alone. As my experience with it increased, such a plan of comparison was abandoned, and the combined method was used in the majority of cases because of one or another of these considerations:

1. The combined method gave me the impression that dosage could be more rapidly increased with less local,

2. Mackenzie, G. M. (Footnote 1, third reference).

3. Besredka, A.: De l'action des sérums par la voie respiratoire, Ann. de l'Inst. Pasteur **34**: 361, 1920.

4. Parker, Julia T.: The Antigenic Properties of Ragweed Pollen, Proc. Soc. Exper. Biol. & Med. **18**: 237, 1921.

5. These fractions refer to that dilution of a stock concentration of 1:70. This method was used so that the dilutions in ointment should correspond to the amounts used in the solutions made for injection.

6. All pollen solutions were put up in four dilutions of the stock solution, which was made up by grinding 1 gm. of pollen in 70 c.c. of diluent. These extended from a 1:20,000 dilution to a 1:10. Occasionally a 1:4 solution was made and used. A preliminary desensitizing dose of 0.25 c.c. was given from a 1:200,000 solution (of the pollen or pollens to be used) at each treatment. If for any one treatment more than one pollen was used, the amounts from the different solutions desired were all drawn into the syringe before injection. With some attention to detail it was nearly always possible to keep the total volume below 1 c.c. and at the same time give the different solutions desired at the time.

The rate of increase was judged by the reactions caused by the previous dose, on which the following rules might be taken as approximate guides: A. If no local reaction was induced in either arm (from the desensitizing or therapeutic injection), the dose was increased four to five fold or more, depending on circumstances. B. If a local reaction was induced in one arm only (therapeutic injection), the dose was increased from two to four times, depending on the severity of the reaction. C. If a local reaction was induced in both arms, the increase should be slight and under twice. N. B. 1. The greatest care must be exercised as one nears the more concentrated solutions. 2. Particularly after more than one large increase in the dosage without local reactions, extreme caution should again be used, as it is apparently possible suddenly to overstep the threshold and induce an almost instantaneous general reaction without the warning of having obtained local reactions.

7. For the comparatively few instances in which a general reaction has followed the injections, given as outlined, I have always found epinephrin of immense value. I believe it should always be available. Given hypodermically in from 0.5 to 1 c.c. doses, it is often startling in the rapidity of its effect. The subject of reaction should, I feel, not be mentioned without emphasizing its dangers—even that of death. R. A. Cooke, in a comprehensive discussion of this aspect (Studies in Specific Hypersensitiveness, J. Immunol. **7**: 119-145 [March] 1922), both endorses epinephrin as the best drug available, and advocates strophanthin in selected cases. In my four years' experience with pollen and protein desensitization I have had only two instances of a delayed general reaction of any severity, in both of which the approximate guides suggested in these remarks were for different reasons ignored.

8. Watson, S. H., and Kibler, C. S.: Etiology of Hay-Fever in Arizona and the Southwest, J. A. M. A. **78**: 719 (March 11) 1922.

and less tendency toward a general reaction, than by injection alone. 2. The season last year was advanced, and one was pressed for time in which to achieve prophylactically the amount of desensitization desired. 3. Considerable guidance with regard to dosage was afforded by the absence or degree of nasal reaction to the inunction. 4. Treatment could be continued, i. e., dosage increased by local application if the patient was forced by circumstances to miss the injection. Under these circumstances, the combined method was used in most of the difficult cases.

The small number of cases and the modifying circumstances in many instances would seem to justify impressions rather than statistical studies of the respective value of the methods of desensitization outlined in this paper. Comparative evaluation of their therapeutic effectiveness with that reported by others is rendered difficult because of the lack of uniformity in the classifications adopted with regard to the degree of protection obtained. In consequence, the definitions which follow—and have been used in this paper—are an attempt to suggest a set of classifications which combine certain features common to previous publications, and which are compatible with the divisions suggested by my own experience.

1. Complete freedom, to include, as well, those who reported an occasional transient attack of sneezing or nasal moisture, or an occasional prodrome, not realized symptomatically. The intervals, constituting practically the entire season, are to be without symptoms. Estimated value, from 90 to 100 per cent.

2. Practical freedom, to include those who were able to continue all their occupations or exercise (train, golf), with no prolonged attacks (part of a day only), and those infrequent; or one short series of more or less continuous mild attacks, following which freedom to be complete. Estimated value, 75 per cent.

3. Marked benefit, to include those who experienced attacks, but none to compare with their former experience and to have had long periods of freedom; may or may not have continued their vocation or avocations. Estimated value, 50 per cent.

4. Slight or no benefit, to include those whose relief was less than that defined in the third class.

5. Aggravation, to include those who obtained no benefit and whose symptoms were seemingly worse than formerly experienced. This fifth class may suit the results obtained in certain cases, particularly in view of the varying severity of seasons in different years, but for practical purposes groups 4 and 5 may be considered identical.

The patients in Table 1 have been grouped according to seasonal type; and in the results of treatment column for last year each season has been considered separately. Because a greater proportion of the cases (those that were ragweed positive, that is) were given the combined treatment, the results obtained previously have been utilized as a type of control.

The column labeled "difficult" refers to the manner in which the patient responded to increase in dosage. If the necessary increase, because of the imminence of the time of onset, induced sufficiently severe reactions to retard the desired progress, the case at once became in varying degrees difficult to treat. The degree in which this occurred is approximately shown by the use of the plus sign.

In the comment column, the observations have been confined to bronchial asthma as an all season complication, if due to proteins as shown by appropriate tests, or to bronchitis if severe. "Late" means that only to a limited extent was the treatment preseasonal. "Interrupted" and "incomplete" refer to the course of treatment. "Out of town" means that the course was completed by cooperation with others living outside Toronto. In varying degrees these factors militate against the best results, and hinder satisfactory comparison.

TABLE 1.—ANALYSIS OF CASES

Case No.	Seasons: Spring	Seasons: Summer	Seasons: Autumn	No. of Pollens Injected	Injections Only	Combined Treatment	Difficult	Therapeutic Results: Previous Year	Therapeutic Results: Last Year	Post-Treatment Sensitization	Comment
Group 1											
1	+	..	..	2	+	..	..	..	2	?	Late
2	+	+	..	4	+	..	..	..	1,1	0	
3	+	+	+	5	+	..	..	1,1	1,1,1	—	
Group 2											
4	..	+	..	1	+	..	..	..	1	0	Bronchial asthma
5	..	+	..	3	+	..	..	..	1	—	Bronchial asthma
6	..	+	..	4	+	..	..	..	1	—	
7	..	+	..	1	+	..	..	1	..	0	
8	..	+	..	4	+	..	..	..	1	0	
9	..	+	..	4	+	..	+	2	2	+	Late
10	..	+	..	3	+	..	..	3	2	0	Out of town
Group 3											
11	..	+	+	2	+	..	++	3	..	0	Late
12	..	+	+	2	+	..	..	1,1	..	0	
13	..	+	+	3	+	..	..	..	1,2	0	Interrupted: out of town
14	..	+	+	8	+	..	++	2,3	1,3	+	Late; incomplete
15	..	+	+	5	..	+	+	1,1	1,2	+	
16	..	+	+	3	..	+	..	1,1	1,2	?	Out of town
17	..	+	+	5	..	+	..	..	1,1	?	
18	..	+	+	7	..	+	+	..	1,1	?	
Group 4											
19	..	..	+	2	+	..	..	1	..	—	
20	..	..	+	3	+	..	..	2	..	0	Incomplete
21	..	..	+	3	+	..	+	2	..	+	Late
22	..	..	+	3	+	..	..	..	2	+	Bronchitis
23	..	..	+	3	+	..	..	..	1	?	Bronchial asthma
24	..	..	+	2	+	..	+	..	3	0	Incomplete
25	..	..	+	3	+	..	..	..	1	?	Late
26	..	..	+	3	+	..	++	..	4	+	Late; incomplete
27	..	..	+	2	+	..	++	..	4	0	Late; incomplete, out of town
28	..	..	+	2	..	+	+++	4	2	?	Prev. year late and incomplete
29	..	..	+	3	..	+	..	2	2	+	
30	..	..	+	2	..	+	..	1	1	—	
31	..	..	+	2	..	+	+	4	2	?	Prev. year incomplete; out of town
32	..	..	+	3	..	+	..	1	5	++	
33	..	..	+	3	..	+	..	3	1	—	
34	..	..	+	4	..	+	++	2	2	?	Late; incomplete
35	..	..	+	3	..	+	..	2	1	?	
36	..	..	+	1	..	+	..	2	1	—	Bronchitis
37	..	..	+	3	..	+	..	1	1	0	
38	..	..	+	1	..	+	..	..	3	+	
39	..	..	+	3	..	+	+	..	1	—	
40	..	..	+	3	..	+	+++	..	4	++	
41	..	..	+	3	..	+	++	..	2	?	
42	..	..	+	2	..	+	..	..	3	+	
43	..	..	+	3	..	+	..	..	1	—	

* The sign + signifies a marked cutaneous reaction; the sign ? a reaction of doubtful degree (from 4 to 6 mm.); the sign — no reaction or one less than 4 mm.; the sign 0 that post-treatment tests were not made. The figures under column Therapeutic Results refer to the foregoing classifications.

In the first group of three cases, five seasons were completely free and one season practically free, in which latter the treatment was only partially prophylactic, all the higher dilutions being given during the earlier part of the season. The third patient suffering throughout all three seasons illustrates a mild type of autumnal attack in contrast to the spring and summer. The previous year, fairly severe symptoms developed in September after a free spring and summer. Tests done then showed ragweed and goldenrod to be positive, both of which had previously been negative.

In the second group (summer hay-fever only) there are five instances of complete freedom, one of which was obtained the previous year and last year remained free without treatment. In the two remaining cases, which were practically free, the treatment could not be regarded as ideal, as one patient was late and treatment was continued during the season, while the second was to a great extent out of town.

In the third group (combined summer and autumnal variety) there are, as regards the summer type, six instances of complete freedom out of six cases treated last year; the case with complete freedom during the previous year remaining free last year without treatment. As regards the autumnal type, there are two instances of complete freedom, three of practical freedom and one of marked benefit. In these less satisfactory results, the factors militating against success, such as lateness, interruption and incompleteness, are noticeable. Four cases were treated by the combined method; and despite difficulties in treatment, and the factors as noted in the last column, two complete and two practical "reliefs" were obtained.

TABLE 2.—DEGREE OF PROTECTION

	Group 1 (Spring Included)	Group 2 (Summer Only)	Group 3 (Summer and Autumn)	Group 4 (Autumn Only)	Number	Per Cent.	
Complete freedom	2	5	3	10	20	46.5	90.7
Practical freedom	1	2	3	8	14	32.6	
Marked benefit	0	0	2	3	5	11.6	
Little or no benefit	0	0	0	3	3	7.0	9.3
Aggravated	0	0	0	1	1	2.3	
Total	3	7	8	25	43		

In the fourth group (twenty-five cases of the autumnal type) twenty-two cases were treated last year, among which there are nine instances of complete and six of practical freedom; three patients obtained marked benefit, three slight or no benefit, and in one case the symptoms were aggravated. Success was jeopardized by the poor opportunity for treatment in one of the three obtaining only marked benefit, and as well, in two of the three with no benefit. No such explanation, however, can be advanced as a cause for one case of no benefit, and for the case which was aggravated, but which the previous year was completely protected.

Table 2 summarizes the degree of protection. In this the results for each season are not taken into account as they were in Table 1, the most unfavorable outcome being taken as indicative of the protection obtained.

Local application was employed with twenty cases out of the thirty-three in Groups 3 and 4. These numbers are obviously too small to serve as a basis for any conclusion; moreover, the different circumstances militating against a fair trial were too frequently present in both the injection and combined treatment groups. Without attempting to assess these varying factors, the percentage results obtained show that the combined treatment in contrast to injections alone was slightly more successful. The figures for combined treatment versus injection alone respectively are in complete freedom 45 and 30.7 per cent., in practical freedom 35 and 30.7 per cent., in marked benefit 10 and 23 per cent., and in no benefit, including aggravation, 10 and 15.3 per cent.

In Table 1, the results of sensitization after treatment have been noted because a consideration of these suggest that, when this is marked, the combined treatment may be contraindicated. An attempt was made to ascertain the correlation between the cutaneous and the nasal reactivity in a few cases. The contrast afforded among these cases so tested showed a fairly marked degree of similarity, when one considers the relative character of the amounts used and the difference in the methods used to elicit this. Apart from any theoretical considerations, an analysis of the degree of post-treatment sensitization and the therapeutic results show that, in both Groups 3 and 4, there were six cases treated by the combined method in which the post-treatment sensitization was marked. The results in these were three of no benefit, including the one case of aggravation, two of marked relief, and one of practical freedom. This proportion of poor success or failure is greater than in the other treated by the combined method, and also greater than that obtained in similar cases treated by injection alone. Admittedly, the numbers are too small, but the effect at least raises the question of the advisability of using local application in those cases in which previous tests have shown marked cutaneous sensitization after injections alone, especially if the results obtained had been satisfactory.

The conclusions drawn by MacKenzie, using a different method of local application by itself, combined with and contrasted to hypodermic injections alone, left me with the impression that he considered its further use justified. My results lead me to concur with the restriction that it may be contraindicated in certain individuals.

OBSERVATIONS ON THE DISTRIBUTION OF VITAMIN B*

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The absolute necessity of an adequate supply of vitamin B, in the dietary of growing animals, if growth is to be maintained at a normal rate, is a fact that has been established beyond question. Among the earlier observations on this point were those of Osborne and Mendel,[1] Hopkins[2] and Stepp.[3] These authors, working independently, arrived at the same conclusions, although their ideas as to the nature of the hypothetic substance were at variance. Since that time, research has led to the demonstration of vitamin B in "milk, rice, wheat embryo, cotton seed, pancreas, maize kernel, wheat, oat, kidney beans, yeast, ivy beans, peanut meal"[4] and many plants used as food in the form of "greens," such as asparagus, celery, dandelions and lettuce.[5]

An adequate supply of vitamin B is necessary not only because of the growth stimulating properties of the vitamin itself but also because of its influence on the general food intake of the animal.[6] All experimenters in the field of accessory food substances have observed the stimulating effect of an adequate vitamin supply on

* From the Department of Bacteriology, School of Hygiene and Public Health, Johns Hopkins University.

1. Osborne, T. B., and Mendel, L. B.: Pub. 156, Parts 1 and 2, Carnegie Institution of Washington, 1911.
2. Hopkins, F. G.: J. Physiol. **44**: 425, 1912.
3. Stepp, W.: Biochem. Ztschr. **22**: 452, 1909; Ztschr. f. Biol. **57**: 135, 1911-1912.
4. Osborne, T. B., and Mendel, L. B.: J. Biol. Chem. **32**: 309 (Dec.) 1917.
5. Osborne, T. B., and Mendel, L. B.: Further Observations on the Distribution of Vitamin B in Some Vegetable Foods, J. A. M. A. **78**: 1121 (April 15) 1922.
6. Cowgill, G. R.: Am. J. Physiol. **57**: 420 (Oct.) 1921.

the appetite of their animals. These substances need be present in only minute quantity, but their presence is essential. It is this relation to appetite and food intake that prompts this report.

In the course of certain studies on bacterial nutrition it became of interest, at one time, to test the basal ingredients of culture medium of organic origin, i. e., peptone and beef extract, for their vitamin content. This research was especially indicated, since the literature is not clear on this point. Bayliss,[7] in his discussion of the growth promoting principle "Bios," says: "It is present in Liebig's meat extract and commercial peptone." Funk[8] reports the presence of vitamin in meat juice and meat extract, and Osborne and Mendel[4] as well found "a small amount of the water soluble food hormone" in meat extract.

EXPERIMENTAL METHODS USED

The tests were carried out on young rats, weighing from 50 to 75 gm., which were failing to grow on a diet known to be adequate to promote growth at a normal rate when sufficient vitamin B was supplied. The food mixture consisted of casein, 18 per cent.; sugar, 17; starch 52.5; butter fat, 10, and salt mixture, 2.5. Inspection shows this mixture to be adequate except for the deficiency of vitamin B.

The peptone and beef extract were added to this ration in place of definite quantities of starch. Each substance was tested in the amount of 2.5 and 7.5 per cent. of the ration.

RESULTS

In no case was the decline of the experimental animals stopped by the addition to the ration of definite quantities of either peptone or beef extract.

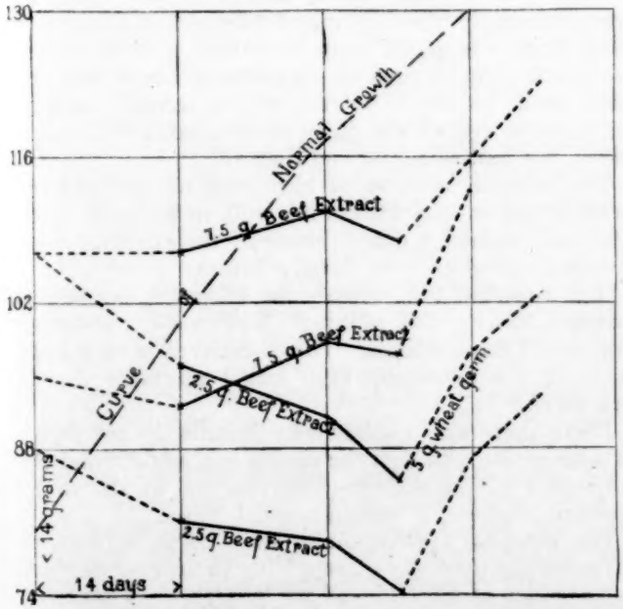

Chart 1.—Failure of rats that had declined on a diet deficient in vitamin B to recover when beef extract was added as a source of this factor.

The accompanying charts show typical growth curves of rats fed this experimental ration. The initial period of decline, on a diet deficient in vitamin B, is indicated by the dotted line. Following this is the period when the animals were fed the same basal ration plus the peptone or beef extract and failed to recover; and finally there is the period of recovery, indicated by the rapid rise of the growth curve when the basal ration was supplemented by wheat germ as a known source of vitamin B.

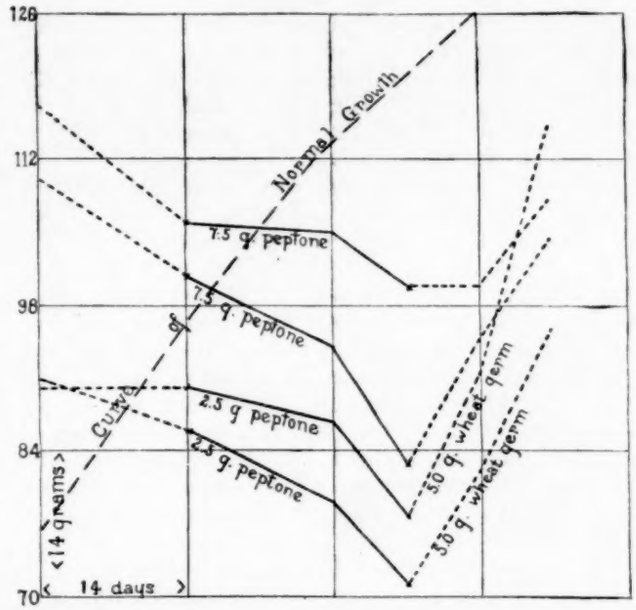

Chart 2.—Failure of rats that had declined on a diet deficient in vitamin B to recover when peptone was added as a source of this factor.

CONCLUSIONS

Commercial beef extract and peptone are devoid of the water soluble vitamin B.

NOTE.—The importance of these observations in connection with the use of beef extract in convalescence will be recognized by all who heard Dr. Mendel at the recent Congress of American Physicians and Surgeons in Washington describe the relation of vitamin B to appetite and food intake.

7. Bayliss, W. M.: Principles of General Physiology, 1915, p. 260.
8. Funk, C.: München. med. Wchnschr., 1913, p. 2614.

THE PRACTICAL APPLICATION OF THE RESULTS OF VITAMIN STUDIES

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Our knowledge of vitamins has given a new basis for the evaluation of foods. Certain articles which, from the point of view of their energy value, are almost worthless have been shown to possess great nutritive value. Their importance is not suggested by their chemical analysis. They furnish something very essential in a human diet.

The tomato, cabbage, spinach, lettuce, chard and all the green or leafy vegetables are composed chiefly of cellulose, water and inorganic salts. Fruits have sugar, vegetable acids, water and salts, but none of these things suggest their essential value as foodstuffs.

Many of our foods we no longer eat in their natural state. The conditions of modern life have made necessary the transportation of foods for long distances and the preservation and storage of food in immense quantities for long periods. A certain amount of injury is done to our vegetables, fruits, milk, meats and grain by the processes to which they are subjected in preparation, preservation and storage. The study of vitamins has helped us to understand, to some degree at least,

the nature of that injury. Some of it is due to the heat applied during our ordinary processes of cooking; some is a consequence of heat applied for purposes of sterilization, whether for the destruction of the germs of disease or for the preservation of food.

We have also sacrificed something in their nutritive value by the refinement of our foods, as in polishing rice and using only the white flour of our wheat to make our bread, and feeding to pigs and cows the balance of the grain. The coarse black bread of the middle ages and of the European peasant of today is despised by our modern civilized city dweller.

But let us not at the same time forget the immense benefits of the preservation and storage of food. Take, for example, the question of white wheat flour. As long as wheat was grown and milled, as it still is in most European countries, within a comparatively short distance of the place where it was consumed, and was used within a few weeks of milling, the problem was a simple one. At present much of our milling is done 1,000 or 2,000 miles from our large centers of population. Not only must the time required for transportation be taken into account, but also the necessity for storage of immense quantities as a normal food reserve. New York City, for instance, consumes more than 20,000 barrels of flour every day. Much of this, it is estimated, has been milled five or six months before it is eaten. White wheat flour keeps indefinitely, certainly for many months, without any important deterioration. But whole wheat flour can be kept only about thirty days; after that it is likely to become "wormy." Flour experts tell us that the general adoption of whole wheat flour for bread in this country is an economic impossibility. The modern method of milling and our system of transportation and storage make a bread famine here almost impossible.

Although heating milk may injure or destroy its vitamins, this fact does not invalidate its great advantages, such as protection from diseases which may be communicated through milk and its preservation by drying, condensing or sterilizing, which permits its wider use as a food all over the world. The same may be said of the canning and drying of vegetables, fruits and eggs. These preserved foods are all of great benefit in the nutrition both of children and of adults. We would not stop the use of them if we could.

Our knowledge of vitamins has, however, pointed out that these procedures have their disadvantages, even their dangers; but when the nature of these is once thoroughly understood and their importance appreciated, the remedy will come also.

In the food of infants it is only vitamin C that is likely to be injured by any process to which their food, chiefly their milk, is subjected in preparation or preservation. In the first place, it should be understood that the amount of this vitamin in milk is small. Chick and Hume found that, to protect a guinea-pig, whose food contains no other source of this vitamin, 100 c.c. daily of fresh milk is required, although complete protection is secured by only 1.5 c.c. of orange juice.

It is well established that all heating of milk (I do not, of course, mean warming for feeding) whether by boiling, pasteurizing, sterilizing, drying or condensing, injuries this vitamin. It has not been shown that vitamin A or vitamin B in milk is thus injured. The amount of injury done to vitamin C depends on the height of the temperature and the length of the period during which the temperature is maintained, and possibly on whether the heating is done in open or in sealed vessels. The duration of the heating seems clearly more important than the temperature employed. Short heating at a high temperature apparently does less injury than prolonged heating at a lower temperature; so far as its effect on this vitamin is concerned, boiling for five minutes seems better than pasteurizing for thirty minutes.

While there is still considerable difference of opinion among investigators as to the relative amount of damage done by various types of heating, it may be regarded as proved that they all injure milk in this respect, and that the only safe rule in practice is to supply some efficient antiscorbutic in the diet of all infants reared on milk treated in any one of these ways.

Evidently the body has a sufficient store of this vitamin to meet its needs for a considerable time, for symptoms of scurvy do not usually appear for some months after the deficient diet has been taken. Of the last nine cases of infantile scurvy treated in my hospital service, the period was between five and seven months in seven, and in none more than nine months.

If the food contains even a small amount of antiscorbutic vitamin, the development of scurvy will be delayed. To infants whose principal or sole food is any one of the forms of heated, dried or condensed milk, it would appear, then, to be quite sufficient if an antiscorbutic were begun at the age of 5 months.

The observations of Hart, Steenbock, Ellis and others indicate that the vitamin content of cow's milk is affected by the food of the animal. This was first shown to be true of the vitamin C. The winter milk of stall-fed animals was decidedly poorer in this respect than the summer milk of pastured animals. The same law seems to hold with respect to all the vitamins. If the food of the cow does not contain an adequate supply, the milk may be deficient in any or in all of them. It would seem, therefore, a wise precaution during the winter to supplement cow's milk by other foods known to be rich in this vitamin, such as the yolk of egg or the juice of steamed green vegetables, but best of all by cod liver oil.

The vitamin content of the food of the nursing mother undoubtedly affects her milk in a similar way. This may furnish a clue to some of the puzzling cases of scurvy developing in nursing infants.

It is reported that, among the Filipinos, beriberi is common among the nursing children of rice-eating mothers of those islands. This is believed to be a large factor in the extremely high infant mortality that is seen there.

These facts may explain why infants do not thrive on some milks, although the supply is abundant and the proportion of the different constituents, as shown by chemical analysis, is within normal limits.

The practical application of these facts is, first, to recognize the necessity of supplying to nursing mothers a diet which is ample in all the vitamins. Vitamin A and vitamin C are the ones most likely to be lacking in the diet of the poor. These vitamins are abundantly supplied by milk, eggs, green vegetables and fruits, all of which unfortunately are expensive foods but should be included in the diet.

I have never seen and have never known of a case of scurvy in a child over 2 years old who was living under normal peace conditions. So far as vitamin A —so indispensable for the growth of children—is concerned, it is necessary only that care be taken that the

diet include an ample supply, since it is not likely to be injured in the preparation or preservation of food.

We know well the dangers of vitamin deficiency when the diet is necessarily restricted, because conditions do not admit of choice or variety of food. These conditions exist in times of famine or great food shortage, or even may be the result of poverty; also in prisons, army camps, on shipboard, in the arctic regions and, one must add, in infancy. The consequences to children are serious, whether we consider simply arrested growth and general malnutrition or the diseases, such as scurvy and beriberi, which result from marked and prolonged deficiencies. But it does not seem probable that, except in conditions like those mentioned, either children or adults who take the average or usual diet are likely to receive such small quantities of the vitamins as definitely to interfere either with growth or normal nutrition.

A glance over the list of foodstuffs known to contain the different vitamins shows how abundant vitamins are in most common foods. This may be one of the reasons why, in the evolution of the diet of the human race, certain foods have a place. It seems perfectly evident that, unless the diet given is a very one-sided one, children receive in their usual food a liberal supply of all these essential food constituents.

Two very striking things are brought out in the investigation of vitamins by observations on animals: One is the very small amounts which are apparently required to produce their effects, and the other is the specificity of their action.

Until these substances have been isolated, we shall not know the amounts required for normal nutrition. Apparently, the amount of any one of them is not large.

Chick, Drummond and their associates at the Lister Institute have shown how much of different foods is required to protect laboratory animals against beriberi and also against scurvy, when the diet contained no other source of the vitamin in question. While this establishes much that is important with regard to the relative value of foods, it gives us no idea as to the actual amounts required by human beings. All the evidence goes to show that the vitamin requirement is affected by many conditions. It undoubtedly varies even in animals. Laboratory animals in confinement might be expetced to show effects of deficiencies in diet sooner than those living under natural conditions. It is well known that men who were much exposed and doing hard work were affected by scurvy sooner than others, although all had the same diet. If the human diet is poor in other respects, the effects of the absence of the antiscorbutic or any other vitamin is more quickly apparent.

How much of the different vitamins is needed for health we do not yet know. It is clearly not a definite amount for all human beings of the same age, sex and weight; but, like our other food requirements, the vitamin need no doubt varies with many conditions.

The great importance of vitamins for growth makes it imperative that the diet of children especially should contain the articles of food that are rich in these factors. The requirements of adults are for maintenance merely and undoubtedly are much less than those of children. This is especially true of vitamin A.

It is during the period of infancy that children are likely to suffer most: first, since infants are the most susceptible of human beings to all adverse conditions; secondly, infancy is the period of most rapid growth, and anything which may affect growth produces its most marked effects at this time; and finally, the diet of infancy is necessarily a restricted one.

Proprietary foods are harmful, not so much from what they contain as from what they lack. They may be deficient in all three of the vitamins.

The specificity of action of these substances is quite as great as that of antitoxin in diphtheria or thyroid extract in cretinism The different vitamins seem entirely independent of one another in their activity. They are in no way interchangeable; they seem to have no relation to one another. We cannot supply a deficiency in vitamin B by giving more of vitamin A, nor can we protect against scurvy by the most liberal allowance of vitamin B. Each one has a perfectly definite function in nutrition, which, from all evidence now in our possession, can be performed by it but by nothing else.

If no vitamin deficiency exists in the diet, it does not seem probable that general symptoms of malnutrition in children past the period of infancy who are taking a varied diet are due to a deficiency of any of these factors, or that improvement in general nutrition is likely to follow their administration in larger amount, when no real deficiency exists. In other words, benefit from an excess of any of them seems most improbable, and we lack proof that such is the case.

Another practical question is whether if the diet is low in its vitamin content, i. e., a condition of relative deficiency exists, there may occur perhaps not frank scurvy, beriberi, rickets or keratomalacia, but milder and less definite symptoms, such as failure to make normal progress in growth, malnutrition and general evidence of ill health. This is something difficult to establish. On *a priori* grounds it seems not improbable. It must be remembered, however, that symptoms such as those mentioned may be due to a great variety of causes other than vitamin deficiency. In the absence of definite means of diagnosis, the only evidence of their dependence on vitamin deficiency is the therapeutic test, namely, prompt and decided improvement, which follows when foods known to be especially rich in the different vitamins are added to the diet—such as orange juice or yeast or cod liver oil.

Reasoning from experience with deficiency diets in animals, one would expect to see improvement in a few weeks. In this connection one is reminded of the "patent medicine" advertisement which ran somewhat as follows: "If you are not cured you haven't got the disease. The remedy never fails."

It should first be evident from an analysis of the diet that a deficiency probably exists. The changes made should be as carefully planned as are laboratory experiments with rats or guinea-pigs. Otherwise the results reported to follow are likely to depend on either the faith or the skepticism of the observer.

Some suggestive observations on the use of antiscorbutic vitamin have been made by Hess and others, in which the weight curve of infants showed a prompt rise on addition of orange juice to the daily diet; but in many or most of these cases the diet was known, or at least strongly suspected, to be poor in this factor.

Vitamin B has been urged upon the profession in the form of yeast as being especially important for children who are not making the normal gain in weight, who suffer habitually from poor appetite, chronic constipation, etc. My own experience has been one of complete disappointment.

However, in view of the important part which we now know to be played by vitamins in nutrition, it behooves the physician in all cases of malnutrition, particularly when the explanation is not obvious, to investigate carefully the character of the food and its preparation to discover any errors that might result in a vitamin deficiency. Especially is this necessary in the case of chronic invalids or of delicate children whose diet has become greatly restricted from necessity or from caprice, and in the case of infants, whose diet is always a restricted one. But, until we have some more certain means of diagnosis than we now possess, the indiscriminate use of vitamins in other circumstances than the foregoing for what is often referred to as "general results" is not likely to be beneficial; it should be discouraged. It is hardly scientific therapeutics.

It is most unfortunate that the popular interest in vitamins, which is the result of so much recent publicity as has been given to this whole subject, should be exploited commercially. Just now vitamins are in fashion, and as much capital as possible is being made of this fact. The medical profession, at all events, should not be carried along in the popular current. Important and indispensable though vitamins are, one can fall into no greater error than to assume that vitamin deficiency is the chief cause of all chronic nutritive disorders; just as not very long ago these were all referred to autointoxication, and at present a certain group would have us believe that they are due to some disturbance of the glands of internal secretion. The use of vitamins without definite indications will be popular for a period but, like other fads, it will pass. With time and further investigation, their true place will be determined.

Our knowledge of vitamins has taught the necessity of a variety of food and the danger which follows when conditions make a choice of variety impossible. It has taught us also the incomparable value of certain foods, particularly of milk, not only in infancy, but during the entire period of growth; also the importance in the diet of children of the green or leafy vegetables. The chief objection to some, such as cabbage, lettuce and celery, when used in a raw state is the difficulty of making children masticate them properly.

Our knowledge of vitamins has greatly helped to put the whole subject of nutrition on a scientific basis. The experimental method has been substituted for the empiric one in determining the value of the different foods. Formerly we might know that certain foods were desirable or necessary; now we are able in very many cases to say why such is the case and to determine their precise value in nutrition. A knowledge of vitamins has furnished a key to many problems in nutrition which before were obscure or insoluble.

Until they have been confirmed by clinical experience there is, however, some danger in relying too much on the results of laboratory observations on animals of a different species, whose physiologic needs may be different from those of human beings.

The study of vitamins has taught us several important things regarding the nutrition of children.

Children should eat a variety of food, and special dangers may follow the habitual use of a very restricted diet.

Milk is the one indispensable food for children. The diet during the entire growth period should include, if possible, whole milk, or if skimmed milk is used it should be supplemented by butter. Of the butter substitutes, those which contain beef fat, mutton fat and peanut oil are better than those in which other vegetable oils or lard are important constituents.

A diet which includes no milk whatever should contain ample amounts of the green or leafy vegetables.

Cereals, particularly those from whole grains, and potato are important and adequate sources of vitamin B.

Fruits have other uses than as laxatives and as sources of mineral salts; they should form a regular part of the diet. When fresh fruits are not available, dried fruits may be given; but they are distinctly inferior to canned tomatoes as sources of the antiscorbutic vitamin.

Cabbage is such a rich source of all the vitamins that it should form a larger part of the diet than is usually the case, especially since it is cheap, and in winter often almost the only green vegetable available.

In normal peace conditions, the results of vitamin deficiency are most often seen in infancy. In rare cases they may be seen in older children and in adults when there is extreme poverty, and still less frequently in those suffering from chronic disease, or in very delicate children whose diet for a long period has been greatly restricted.

If the daily diet contains in reasonable amount unskimmed milk, cereals, potato, green vegetables and fruit, one need not fear a vitamin deficiency. While these articles are especially rich in vitamins, nearly all of our common foods contain them.

155 West Fifty-eighth Street.

CLOSTRIDIUM BOTULINUM

II. PRESENCE IN THE HUMAN ALIMENTARY TRACT *

FRED W. TANNER, PH.D.
AND
GAIL M. DACK
URBANA, ILL.

The importance of *Clostridium botulinum* as a cause of food poisoning, and probably food infection, justifies extensive study of its distribution. At frequent intervals it has been reported in the intestinal contents of both apparently healthy and diseased animals and human beings. The present paper is a report of a short study on its possible presence in the intestinal tracts of healthy human beings.

Van Ermengem [1] isolated the organism from the intestinal tracts in fatal cases of the disease. In 1897, however, he could not find it in the intestinal contents of fish, or in cow or horse manure, or duck excreta. Burke [2] found the spores of this organism in insect droppings and manure from a hog which had recovered from botulism three months before. Dickson [3] examined the intestinal contents of 250 hogs without finding the organism in a single instance. Kempner and Pollack [4] isolated it in 1897 from the intestinal contents of a hog. We [5] found it in three specimens of hog feces and one sample of sewage. Graham and Barger [6] found *Clostridium botulinum*, Type A, in one specimen of feces and five specimens of urine from

* From the Department of Bacteriology, University of Illinois.

1. Van Ermengem: Centralbl. f. Bakteriol., Part I, **19**: 442, 1895.
2. Burke, G. S.: J. Bacteriol. **4**: 541-553 (Sept.) 1919.
3. Dickson, E. C., quoted by Burke (Footnote 2).
4. Kempner and Pollack: Deutsch. med. Wchnschr. **23**: 505, 1897.
5. Tanner, F. W., and Dack, Gail M.: J. Infect. Dis., to be published.
6. Graham and Barger: Univ. Bull. **19**, No. 7, 1921.

widely separated spontaneous cases of poliomyelitis in Illinois. Graham and Schwarze [7] isolated the organism from the intestinal contents of chickens that had died of limber neck.

In order to determine whether the spores of the organism might be present in the intestinal tract of the healthy human being, samples of stool were collected from ten different persons.

TECHNIC

Ten samples of feces from apparently healthy persons were brought to the laboratory on sterile swabs. The samples were broken up in sterile physiologic sodium chlorid solution and transferred to sterile corked test tubes. These were shaken vigorously for about ten minutes on the shaking machine in order to secure a homogeneous preparation. The tubes were then put into a constant temperature bath at 80 C. for thirty minutes in order to destroy the vegetative cells which were present. Various qualitative dilutions were made, and the material was plated out in dextrose agar. The plates were made anaerobic by Dick's method. After incubation at 37 C., the plates were carefully examined for colonies like those of *Clostridium botulinum*. Suspicious colonies were transferred to sterile tubes of sheep brain medium, which were incubated at 37 C. after being made anaerobic with sterile paraffin. The sheep brain medium cultures which gave the characteristics of growth generally secured in this medium were tested serologically for the presence of the botulinus toxin. One cubic centimeter portions were fed to guinea-pigs by mouth. Those animals which died with the usual symptoms were examined postmortem, and new cultures in brain medium were inoculated with material from the brain of the guinea-pigs. It has been found that the organism may be isolated from the brains of guinea-pigs which have died with a typical case of botulism. This culture was then carefully purified and typed against antitoxin kindly supplied by Prof. Charles Krumwiede.

RESULTS

Two of the ten specimens of feces from apparently healthy human beings were found to contain the organism. Five others gave very strong evidence of its presence. The cultures from these five samples, however, formed weaker toxins, and death in the guinea-pigs was delayed for as long as twenty days in one instance. The guinea-pigs, however, died with the usual symptoms at the end of that time. This delayed death has also been mentioned by others. Since these strains reacted so sluggishly to the usual tests, they were not regarded as absolutely positive, although we feel that they were *Clostridium botulinum*. An analogy may exist between the delayed symptoms in guinea-pigs and those in human beings. It is possible that some of the severe gastro-intestinal disturbances often occurring in isolated cases and in groups may have been due to a weak toxin capable of causing symptoms only superficial to those caused by a strong toxin. Perhaps the incubation period in some of these cases may be so delayed that the apparently spontaneous symptoms, when they appear, are not connected with the ingestion of a poison-containing food.

The significance of these data is perhaps merely suggestive. Our results seem to be somewhat confirmed by the more recent contributions on the presence of the organism in the soil. Tanner and Dack [8] and Meyer and Geiger [8] have shown that the organism is quite widely distributed in the soil. The latter investigators have proposed that certain geographic areas may be more heavily seeded than other areas. It would not be unexpected to find the organism on foods which are eaten fresh or which are partially or imperfectly cooked. An analogous situation seems to exist in *Clostridium tetani*. The work of Nicolaier and others [9] has shown that this organism is abundant in the superficial layers of the soil, and especially in soil which has been cultivated and fertilized. The recent work on forage poisoning [10] by a number of investigators also indicates that the organism may be distributed in soil and may thus reach food. In the numbers that would get into food, its presence is probably not significant. Armstrong, Story and Scott [11] reported that pigs receiving 120,000,000 spores subcutaneously died in four days, while animals receiving 12,000,000 and 1,200,000 spores remained well. Orr [12] has given this subject more elucidation. While Orr admits the possibility of toxemia due to the ingestion of detoxicated spores, he regards it as of very rare occurrence, if it ever occurs. Thus, it seems that the spores of *Clostridium botulinum* may be present in the intestinal tracts of apparently healthy persons without any untoward symptoms or results.

SUMMARY

Two of ten specimens of feces from healthy persons were found to contain *Clostridium botulinum*. Five other specimens gave strong evidence of its presence. The two strains absolutely identified as Type B strains formed powerful toxins in sheep brain medium.

7. Graham, R., and Schwarze, H. R.: J. Infect. Dis. **28**: 317 (April) 1921.
8. Meyer, K. F., and Geiger, J. C.: Pub. Health Rep. **36**: 4-6 (Jan. 7) 1921.
9. Hiss and Zinsser: A Text Book of Bacteriology, Ed. 4, p. 457.
10. Graham, Brueckner and Pontius: Kentucky A. Exp. Sta. Bull. 207, 1917; Bull. 208. Graham and Schwarze: Abstr. Bacteriol., August, 1921; Abstr. 1547.
11. Armstrong, Story and Scott: Pub. Health Rep. **34**: 2877 (Dec. 19) 1919.
12. Orr, P. F.: J. Infect. Dis. **30**: 118-127 (Jan.) 1922.
1. Borden, D. L.: Diaphragmatic Hernia, Ann. Surg. **75**: 337 (March) 1922.

Clinical Notes, Suggestions, and New Instruments

DIAPHRAGMATIC HERNIA AS A LATE SEQUEL OF WAR WOUND OF THE CHEST

HAROLD E. WAXMAN, M.D., PITTSBURGH

An interesting phase of the case here reported is the fact that diaphragmatic hernia may be confused with appendicitis. From a theoretical standpoint it scarcely seems probable that a condition pathologically and anatomically so different from diaphragmatic hernia as acute appendicitis could be confused with the former. Yet this did happen, and Borden [1] recently reported a similar mistake, although in a widely different and more chronic form of diaphragmatic hernia.

REPORT OF CASE

History.—J. B., a white man, aged 28, a city fireman, was admitted to the hospital, Dec. 30, 1920, complaining of pain in the abdomen. December 23, while at a fire, the patient was overcome by smoke. He did not remember much of what had happened to him, but was told by companions that his asphyxia was rather profound, and the pulmotor was used. Before the accident, to the best of his knowledge, he was in perfect health. That evening he began to have a dull pain in the left side of the abdomen just below the ribs. The pain radiated upward to the left shoulder. The pain was not severe. He took no medicines and abstained from food, as part of the after-treatment of the asphyxiation. His bowels moved well that day without causing him any pain or other symptoms, and so continued until December 26, three days after the accident. The dull pain in the left hypochondrium

persisted. December 27, he began to have pain of a dull nature in the right iliac fossa. The onset of this was followed by vomiting. Since then he had vomited at all attempts at eating. The vomited material usually consisted of what he had eaten shortly before. He had not had a bowel movement since December 26, and numerous enemas proved unsuccessful. December 30, he developed acute, agonizing pain in the right iliac fossa, the pain on the left side having subsided. Realizing that his condition was not due altogether to the asphyxiation, he again called his physician, who advised immediate removal to the hospital.

When admitted, he complained only of a sharp, colicky pain in the lower right abdomen and of vomiting whatever food or drink he took. He had not secured a bowel movement for four days in spite of the use of enemas. On the morning of admission, hiccup developed and persisted. He said that the vomiting was almost always preceded by a long period of nausea, which he relieved voluntarily by forcing the act of vomiting when it did not come spontaneously.

The patient said that he had always been active and athletically inclined, enjoying excellent health. He had all the usual minor ailments of childhood, but none of the more serious acute infectious fevers. In 1918, while in action in France, he was wounded "just below the heart" by a machine gun bullet. He was in a military hospital for several months. No exploratory operative treatment was attempted at the time he was shot. He apparently made a good recovery, and said that he had been in excellent health since his discharge from the army. He had never before had any pain of a nature similar to that which he was now experiencing. He had never had a surgical operation of any kind.

Examination.—On the left side of the chest, in the midclavicular line, in the sixth interspace, was a scar from the entrance of the bullet. There was also a scar at the point of exit of the bullet in the left posterior axillary line, in the tenth interspace. The heart and lungs were normal. The abdomen was flat, with no distention, and was tympanitic to percussion above the umbilicus. There was marked tenderness on deep palpation over the entire right iliac fossa, with some rigidity of the right rectus muscle. No tenderness was noted elsewhere, and no masses were palpated. There were no hernias, inguinal or femoral. Rectal examination was negative. The specific gravity of the urine was 1.030; examination revealed: albumin, trace; sugar, negative; indican, trace; casts, none; red blood cells, a few. Blood examination revealed: leukocytes, 15,000; polymorphonuclears, 77; small mononuclears, 17; large mononuclears, 6.

Clinical Course.—December 30, the patient's condition was as described in the history. A diagnosis of acute intestinal obstruction, with probable location in the right iliac fossa, was made. Exploratory laparotomy was urged, but the patient refused his consent. The temperature ranged between 99 and 100 F.

December 31, a marked changed in the patient's condition was manifest. He was restless, and complained of great pain in the right iliac fossa. During the twenty-four hours since admission, four irritant enemas had been given. These were returned practically as given, uncontaminated with fecal matter. The abdomen was distended uniformly. There was exquisite tenderness and marked rigidity of the overlying musculature of the right iliac fossa. The breath had a fecal odor. Operation was accepted. The diagnosis was acute appendicitis or intestinal obstruction.

Operation and Result.—Under ether anesthesia, a right lower rectus incision was made. The cecum, ascending colon, transverse colon and terminal ilium were markedly injected and greatly distended. The appendix was bulbous, infiltrated, bound down, and surrounded by a small quantity of pus. Considerable manipulation and exploration were necessary to locate the obstruction of the intestine accounting for the distention. The splenic flexure of the transverse colon was caught in a small hernia of the diaphragm. The incision was, of course, in the wrong place to deal effectively with both the appendical condition and the diaphragmatic hernia. The patient was in great shock. The knuckle of bowel was hastily freed from the opening in the left diaphragm, and the abdomen closed. The operation was performed by a member of the visiting staff.

The patient did not rally through the night from the shocked condition in which he left the operating table. In spite of all restorative and stimulative measures, he died, twelve hours after the operation.

COMMENT

To have made a diagnosis of diaphragmatic hernia would have been easy enough had this been a case in which the patient did not present an acute condition of the abdomen; if there had been sufficient eventration of the abdominal contents into the thorax to give physical signs, or if a roentgen-ray examination could have been made. In this case the optimum in diagnosis would have been acute intestinal obstruction. With the presence of pain in the right iliac fossa there seems some justification for having regarded the seat of all trouble in that location. Had an incision been made in the upper left quadrant, it might also have been possible to deal secondarily with the appendical condition; but, as is too often the case, in this instance "hindsight seems better than foresight." Undoubtedly, also, operation was too long delayed.

The explanation of the mechanism of production of the hernia may be that, during the violent breathing which the patient undoubtedly employed while overcome by smoke, through greater use of the abdominal muscles in respiration, the increase of intra-abdominal tension was sufficient to rupture the scar in the dome of the diaphragm on the left side and force through the splenic flexure. The accompanying acute suppurative appendicitis beggars explanation. It gave a justification for making the right iliac fossa the location suspected as being also the seat of the acute intestinal obstruction.

5819 Forbes Street.

A PRACTICAL TROCAR AND CANNULA FOR REMOVING ASCITIC FLUID

WILLIAM W. DUKE, M.D., KANSAS CITY, MO.

When ascitic fluid is withdrawn from the peritoneal cavity through the cannula ordinarily used for this purpose, the end of the cannula frequently strikes loops of intestine or the omentum before the desired amount of fluid has been removed. This not only interferes with further withdrawal of fluid, but causes pain and anxiety in the patient. The

Trocar and cannula for removing ascitic fluid: at top, trocar; in center, inner cannula; at bottom, outer cannula.

end of the cannula can be freed from the intestine or omentum by manipulation, and additional amounts of fluid can be withdrawn. Such additional amounts, however, are usually small, and, after manipulation has been attempted several times, further effort at complete drainage has to be abandoned. The result is that a considerable amount of ascitic fluid may be left in the peritoneal cavity. This may drain through the wound made by the cannula for one or several days, and cause the patient much annoyance. This disadvantage can be overcome by the use of the double cannula shown in the accompanying illustration.

The outer cannula consists of a metal tube 9.5 cm. in length with a bore 4 mm. in diameter. This is fitted with an ordinary trocar. The trocar and outer cannula can be introduced into the peritoneal cavity in the usual manner; the trocar can be withdrawn, and in its place the inner cannula with the blunt, perforated end can be introduced. The inner cannula is 13.5 cm. in length, with a bore 3.5 mm. in diameter. This cannula, on account of its length and blunt end, can easily be introduced deep into the pelvis without causing

pain or anxiety in the patient. The flow of fluid cannot be obstructed easily by omentum or loops of intestine, and the result is that the peritoneal cavity can be drained almost dry without difficulty. The advantages of this cannula would appear to offset its only disadvantage, namely, slightly increased cost.

Waldheim Building.

New and Nonofficial Remedies

YEAST PREPARATIONS

Report of the Council on Pharmacy and Chemistry

At its 1922 meeting, the Council directed that a general article, giving the present status in medicine of yeast and yeast preparations, be prepared. A committee was appointed for the purpose. This committee submitted to the Council the report which appears below, with the recommendation that its publication in THE JOURNAL and its subsequent inclusion in N. N. R. be authorized. The Council adopted the report of the committee, and, accordingly, the article, Yeast Preparations, appears below. W. A. PUCKNER, Secretary.

Yeast and preparations from it have long been used both externally and internally in medicine. Yeast, as commonly understood, is the ordinary brewer's or baker's yeast, consisting of the minute unicellular organism *Saccharomyces cerevisiae*. These cells have long been characterized by their power to convert certain sugars into products of fermentation, a reaction in which enzymes present in the yeast are concerned.

So-called dried yeast is usually obtained by filtering off the yeast cells grown on extracts of malted grains; they are completely or partially dried and may, or may not, contain a considerable admixture of starchy substance. Lately, preparations of relatively uncontaminated dried yeast have been marketed. Some of the dried yeast preparations are intended to retain their fermentative power. In others this has been destroyed by the process of desiccation. The so-called compressed yeast sold in freshly prepared form, usually with some admixture of a starchy substance to give it a suitable texture, will retain its fermentative activity for several days when kept at a low temperature. To what extent other micro-organisms are likely to contaminate the commercial yeast preparations is not generally known.

Actions and Uses.—Since fermenting liquids, if concentrated enough, have been assumed to have a bactericidal action, yeast has been proposed for use as a bactericide in the treatment of infections of the superficial tissues. Its application for this purpose has, however, been practically abandoned, although there are traditional accounts as to the healing properties of fresh yeast applied to open wounds. As yeast is one of the richest sources of vitamin B, which has recently come into prominence as a hitherto unrecognized food component essential to nutritive well-being and widely distributed in common foods, yeast and preparations derived therefrom have been widely extolled of late as sources of this vitamin whenever there may be indications for its therapeutic use. The latter are still so indefinite, aside from rather exceptional instances, such as beriberi, and the opportunities to obtain vitamin B through the customary foods entering into the dietary of man are so abundant that the special demand for the yeast vitamin seems to be limited relatively at the present time. At all events, the alleged curative or tonic value of special vitamin B bearing products has been emphasized through widespread advertising to an extent unjustified by available evidence. The beneficial effect of products containing vitamin B on animals subsisting on a diet deprived of this food factor is truly remarkable; but this fact, attested by laboratory observations, should not be interpreted to mean that there is a widespread avitaminosis in this country or that the need for vitamin, other than in exceptional cases, cannot readily be supplied through simple dietary measures. The therapeutic aspects of the vitamin problem are still in the experimental stage.

The ingestion of yeast in liberal portions is known to produce a laxative effect. In some cases, particularly in young children, such use of yeast has been followed by intestinal distention, doubtless attributable to fermentative gas production by the surviving yeast cells. There is, however, a preponderance of evidence regarding the advantageous use of yeast as a mild laxative. Aside from the objectionable possibility just referred to, there are no serious contraindications. Whether the laxative action of yeast is due to the survival of the living cells and some product of their reaction in the intestine or to a chemical component of yeast which may also be present in dead cells is not clear at present. Yeast has often been recommended for internal administration because of its supposed beneficial effects on furuncles, acne, etc. Its adherents assert that it is almost a specific. Many, if not most, clinicians doubt this remarkable effect, which may, after all, be expected from any anticonstipation agent. Whether yeast or its products can provoke a leukocytosis likewise remains undemonstrated. Many of the conditions for which yeast and yeast preparations have been recommended therapeutically are so variable in their clinical course and so likely to show improvement without special treatment that the elaborate claims made in regard to yeast therapy for somewhat indefinite disorders must be largely discounted. It is not clear to what extent, if at all, live cultures of yeast may be used to change the intestinal flora, if, indeed, such a reaction becomes desirable in many of the conditions for which yeast is commonly used.

Concentrated liquid extracts of yeast (which are rich in vitamin B) have long been used as substitutes for meat extracts in making bouillons and soup stocks, and it is asserted that meat extract is sometimes adulterated with yeast. Yeast vitamin concentrates have been prepared from extracts of yeast by a variety of methods.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ANTI-ANTHRAX SERUM (See New and Nonofficial Remedies, 1922, p. 284).

Parke, Davis & Company, Detroit.

Anti-Anthrax Serum: Marketed in syringes containing 50 Cc. (*Bio. 45*). Initial dose of from 50 to 100 Cc., injected intravenously, should be followed by further injection in six or more hours. It is well to test the sensitization of the patient to horse serum, prior to the first injection, by means of the cutaneous test, which will require about one-half hour. The drop of serum required for this test can be obtained directly from the syringe container of Anti-Anthrax Serum.

ANTIMENINGOCOCCUS SERUM (See New and Nonofficial Remedies, 1922, p. 286).

Parke, Davis & Company, Detroit.

Antimeningococcic Serum: Marketed in packages of two syringes, with flexible connection, gravity tube and needle with stylet (*Bio. 170*), each containing 15 Cc.; also in packages of one syringe, with needle and long flexible tube, suitable for intravenous injection either by pressure or gravity method (*Bio. 172*) each containing 50 Cc.

Dosage.—From 50 to 150 Cc., intravenously; from 15 to 30 Cc., intraspinally.

DIPHTHERIA ANTITOXIN-TOXIN MIXTURE (See New and Nonofficial Remedies, 1922, p. 282).

Parke, Davis & Company, Detroit.

Diphtheria Toxin-Antitoxin Mixture.—Diphtheria Prophylactic: Each cubic centimeter of the mixture represents a single human dose, corresponding to the requirements of the Public Health Service. Marketed in packages of 3 bulbs, each containing 1 Cc. (*Bio. 60*) representing one immunizing treatment; also in vials containing 20 Cc. (*Bio. 65*).

TUBERCULIN DENYS (See New and Nonofficial Remedies, 1922, p. 296).

Parke, Davis and Company, Detroit.

Tuberculin B. F. (Bovine).—Made in the same manner as tuberculin Denys (Human), except that the bovine type of tubercle bacillus is used. Marketed in packages of six 1 Cc. sealed glass tubes.

Borcherdt's Malt Extract (Plain) (See New and Nonofficial Remedies, 1922, p. 176).

Borcherdt's Malt Cod Liver Oil and Prosphorus: Each 100 Cc. contains phosphorus, 0.009 Gm. (1/25 grain per fluidounce), cod liver oil, 25 Cc. and Borcherdt's malt extract (plain), 75 Cc.

Dosage.—From 8 to 15 Cc. (2 to 4 fluidrachms), three times a day, after meals.

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SATURDAY, JULY 8, 1922

FEBRILE TEMPERATURE

The current conception of fever involves reactions which consist in an alteration of the body temperature, together with changes in the mechanism which controls this temperature. Fever can be induced by placing the body in an environment so warm and moist that heat cannot be lost by the usual devices of radiation, conduction and evaporation. In such a predicament there is an obvious failure of heat elimination. In persons suffering from ichthyosis hystrix involving an almost complete loss of function of the sweat glands,[1] the body temperature can be varied by altering the temperature of the surroundings. Considerations such as these have been responsible for the view that a prominent factor in the genesis of fever is the failure of the mechanisms ordinarily responsible for the removal of heat from the body. On this hypothesis the increment of heat might be merely an exaggeration of that seen in healthy persons after exercise, but with an imperfect elimination of the heat thus set free.

Water is of so much importance in heat loss by vaporization that one naturally thinks of the rise in temperature as possibly dependent on a failure or inability of the body to "mobilize its water reserve." As stated in a recent article,[2] the ability of the body to utilize water in heat elimination is of the greatest importance in the regulation of temperature. Because of its high specific heat and fluid character, it is capable of absorbing large amounts of heat from the cells and of distributing it to the surface of the body, where it may be eliminated. The dry skin and concentrated urine of acute fevers has often given rise to the belief that the mechanism of heat loss is disturbed.

The latest studies of Du Bois [3] and his colleagues, in a variety of infectious fevers, lend no support to the theory of inability of the body in such conditions to mobilize its water reserve for the elimination of heat. Their results show that the heat lost in the vaporization of water from the skin and lungs bears a fairly constant relationship to the total heat elimination. In cases of erysipelas, for example, the heat lost in the vaporization of water constitutes from 23.6 to 33.4 per cent. of the total heat elimination. During rising, constant and falling temperatures, the percentage of heat eliminated in the vaporization of water was greater than in normal persons; hence the conclusion that fever should not be attributed to failure in the function of water elimination.

The careful earlier calorimetric investigations of typhoid, tuberculosis and malaria are now supplemented by additional evidence from other febrile states to show that rise in body temperature is accompanied by increased heat production, and that the increase corresponds to the degree of fever. Apparently the patient with fever responds to bodily changes by a rise in temperature in a manner which resembles closely the chemical reactions in the test tube suspended in a water bath. According to Barr, Cecil and Du Bois, the increased heat production follows van't Hoff's law, which may be thus stated: "With a rise in temperature of 10 C., the velocity of chemical reactions increases between two and three times." This means an increase of from 30 to 60 per cent. for a rise in body temperature from 37 C. to 40 C. It is important to realize that increment in body temperature may of itself thus "speed up" metabolism.

1. Linser and Schmid: Deutsch. Arch. f. klin. Med. **79**: 514, 1904; abstr. J. A. M. A. **42**: 1526 (June 4) 1904.
2. Barr, D. P.; Cecil, R. L., and Du Bois, E. F.: Clinical Calorimetry, XXXII, Temperature Regulation After the Intravenous Injection of Proteose and Typhoid Vaccine, Arch. Int. Med. **29**: 608 (May) 1922.
3. Coleman, Warren; Barr, D. P., and Du Bois, E. F.: Clinical Calorimetry, XXX, Metabolism in Erysipelas, Arch. Int. Med. **29**: 567 (May) 1922. Barr, D. P.; Cecil, R. L., and Du Bois, E. F.: Footnote 2.

THE GOETSCH TEST IN HEALTHY PERSONS

Medical practice is enriched and mankind benefited by any procedure, prophylactic, diagnostic or therapeutic, by which the problems of disease can be more accurately approached. When Sir John Floyer adapted the watch for the counting of the pulse, he made the civilized world his debtor. The application of chemistry in the test for sugar in the urine has proved to be of enormous help to the physician. The simplified technic for the estimation of basal metabolism has opened new possibilities in clinical medicine. Human nature is not always easily swayed by interest in the novelties of science; but, when it is moved, the pendulum of enthusiasm is often more than likely to swerve too far in one direction before it regains the normal swing. One need but read the history of any new test, new instrumental procedure, new apparatus or new drug, to find abundant illustrations of this dictum.

The epinephrin test introduced by Goetsch for the detection of hypersensitiveness in hyperthyroidism [1] seems to be no exception to the common experience referred to. It depends in principle on the theory that,

1. A good description of the procedure is given by Wearn, J. T., and Sturgis, C. C.: Effects of Injection of Epinephrin in Soldiers with "Irritable Heart," Arch. Int. Med. **24**: 247 (Sept.) 1919.

in an organism in which there is an overabundance of thyroid secretion, the sympathetic nervous system is sensitized to the action of epinephrin. Peabody and his collaborators [2] at the Peter Bent Brigham Hospital, Boston, have already ascertained that, although hypersensitiveness to epinephrin as measured by the Goetsch test is found in many persons showing the clinical picture of hyperthyroidism and an increased basal metabolism, yet it is not always present under these conditions. On the other hand, the Goetsch test may show a positive response in persons who have no other indications of hyperthyroidism.

Significant evidence of this has lately been offered by van Wagenen,[3] who conducted Goetsch tests on a group of students in the Department of Physical Education at Cornell University. He states that "a more physically fit, more symptomless group could not have been desired." Yet in the fifty persons comprising it there were ten positive reactions, or 20 per cent., judged by the characteristic changes in blood pressure, pulse rate, general symptoms and local reactions attending the intramuscular injection of the conventional test dose of epinephrin hydrochlorid. Such facts raise doubt, to say the least, as to the exclusive diagnostic value of a test for hyperthyroidism in "borderline cases" in which, in the absence of observable symptoms of psychoneurosis, neurasthenia and hysteria, so large a proportion of healthy persons respond in what might be designated as a positive way.

REJUVENATION BY TESTICULAR TRANSPLANTATION AND OCCLUSION OF THE SEMINAL DUCTS

The quest through the ages for a mystic agent which shall revive the faded youth of the aged has recently been rewarded—at least so the newspapers allege—by the discovery of the fountain of youth. Indeed, two such fountains have been acclaimed from different sources. Neither of the methods proposed, it is true, promises more than partial rejuvenation of the old. Neither offers, for example, to grow natural teeth to replace artificial dentures, or to garnish a bald pate with a luxuriant thatch. Yet, if a method will renew sexual vigor—and this is the alluring promise—full many a Faust will eagerly barter his worldly goods for drafts from the fountain.

The more sensational of the two methods of rejuvenation now in the limelight is the transplantation into the old man of testicular substance removed from young men, monkeys, goats or whatever the market affords. Each of these sources of material is guaranteed, by somebody, to rejuvenate. A fundamental error in this scheme is the assumption that vigor in general and erectile power in particular are measured solely by some testicular internal secretion, and hence that loss of such power can be remedied by a fresh supply of testicular substance. Physicians know that destructive disease of the thyroid, of the anterior pituitary or of the suprarenal cortex entails loss of sexual power as surely as does castration; that copulative vigor is apparently a composite, possible only when a chain of endocrine glands, including at least those just named, furnish their normal products to the blood, and that under-function of any of these impairs vigor in general, and virility in particular. Removal of the entire thyroid, for example, causes sexual impotence, relieved not by transplanting testes but by feeding thyroid tissue. Since a chain is no stronger than its weakest link, and since in old age all the links of the endocrine chain are weaker than in youth, it is difficult to imagine that the implantation of youthful testicular substance could rejuvenate old men, any more than that the insertion of a new link could strengthen a worn-out chain. The legitimate subject for testicular implantation, by this reasoning, is the otherwise normal young man whose testes have been destroyed by disease or injury. In some such cases, however, this attempt has failed utterly, but in a few other cases, disinterested physicians have attested an improvement, general and sexual, following the transplantation of human tissue. In no instance, so far as we know, has an alleged rejuvenation of an old man been so attested.

A second assumption in this scheme of rejuvenation is that transplanted gonad substance, of whatever origin, continues to function in its new environment. Yet in many instances human tissue, testicular and ovarian, removed months after such transplantation, has been found to have been treated as a foreign body, disintegrated and removed by the tissues of the host. The clinical results of gonad transplantation, as reported by the operators themselves, range from flat failure to marvelous success; thus, the gonad of the goat is said to have cured or mitigated not only sexual impotence but also a score of chronic ailments of diverse etiology and pathology. The veteran Tuffier, whose surgical utterances have long commanded respect, working in a Paris hospital with the precision of a laboratory investigator, implanted ovarian tissue freshly removed from young women into each of twenty women who had passed the menopause; in not one of these was there a return of menstruation or other evidence of rejuvenation. Most of his 230 operations were autotransplantations, removal of ovaries from the pelvis to other locations in the same woman. The results illumine the subject under discussion, for, while menstruation was reestablished in a majority of the women under 30, in only one of fifty-six women over 40 did this flow reappear after autografting. Moreover, even in the youngest women, from four to ten months elapsed after autografting before men-

2. Peabody, F. W.; Sturgis, C. C.; Tompkins, E. M., and Wearn, J. T.: Epinephrin Hypersensitiveness and Its Relation to Hyperthyroidism, Am. J. M. Sc. **161**: 508 (April) 1921.

3. Van Wagenen, W. P.: Some Observations on the Epinephrin Hydrochloride Test (Goetsch Test) in a Group of Normal Individuals, J. Indust. Hyg. **3**: 343 (March) 1922.

struation was reestablished; and, when it did appear, it was irregular and seldom continued more than three years. His verdict is that the therapeutic result of autografting of ovaries is transient; that of grafting from one woman to another is nil. It is difficult to reconcile such facts with the copulative frenzy alleged to occur in old men a few days after implantation of human or other testes, except through mental suggestion. No work on testis transplantation so convincing as Tuffier's ovarian transplants has come to our attention.

A second widely advertised method of rejuvenation emanates from a Vienna physiologist, Steinach. This scheme likewise measures vitality solely in terms of testicular secretion, but claims to increase such secretion in an old man, not vicariously, through transplanted gonads, but directly, by speeding up his own production. The blood supply of the testis is normally divided between the spermatic tubules, which provide sperms for procreation, and the interstitial groups of epithelial cells called Leydig's glands, which are supposed to elaborate the internal secretion. Steinach assumes that, by diminishing the production of sperms, there must result an increased blood supply to the interstitial glands and a corresponding increase of internal secretion, whereupon the old man is young again. A decrease in sperm production is known to follow gradually the occlusion of the seminal duct; hence the Steinach method is simply vasectomy or its equivalent. Some physicians harbor the idea that Steinach devised a method or operation disclosing a new principle; the only novelty was the occlusion of the seminal duct by dividing the vasa deferentia leading from testis to epididymis instead of the vas itself; and the motive for this was the hope of sparing the artery of the vas deferens, the smallest of the vessels supplying the testis, which is necessarily ligated in vasectomy. But since Steinach asserts that identical results followed simple vasectomy in senile rats, and since the Vienna surgeon who applies the theory to human subjects abandoned the so-called "Steinach operation," the Steinach thesis is reduced to simply this: Occlusion of both seminal ducts rejuvenates an old man. Although the flaws in this argument are glaring and numerous, their enumeration is superfluous, because there is overwhelming clinical evidence that occlusion of the seminal ducts does not rejuvenate an old man. A generation ago, when prostatectomy was more dangerous to life than it now is, vasectomy was widely practiced for the mitigation of the evils entailed by prostatic obstruction; leaders in surgery, including Harrison in Liverpool and Rovsing in Copenhagen, reported the results in hundreds of cases of bilateral vasectomy for this purpose in old men; in not one was rejuvenation achieved. In a recent article, a Steinach follower, apparently realizing that the latter's scheme for rejuvenation died before it was born, naively explains that the old men vasectomized a generation ago did not secure rejuvenation because they were not expecting it! Apparently, then, occlusion of the seminal ducts increases testicular secretion only when the old man is convinced in advance that he will be rejuvenated. It should be possible to induce such conviction without resorting to surgery.

Current Comment

MEDICAL ETHICS

One factor distinguishing medical from other professional ethics is that medical ethics relates largely to acts immediately affecting the lives and health of human beings, and not to merely abstract principles. This distinction has been recognized, since the days of Hammurabi, in all statements of principles, or so-called codes, of medical ethics. It is interesting to note, too, the permanence of the statements of ethical principles governing specifically the acts of physicians, as formally approved by the American Medical Association, since the adoption of the "Code of Ethics," at the first annual session of the Association, in 1847. The code then adopted continued in effect until 1903, when, at the New Orleans session, it was superseded by a new statement there adopted, and the title changed from "Code" to "Principles" of medical ethics; but even then only minor modifications were made, the most important being the omission of the chapter defining the relationship which the public and the patient should hold to the practitioner of medicine. In 1912, the statement of the "Principles of Ethics" was revised, but the changes were hardly more than changes in phraseology. New conditions, however, have recently developed in the practice of medicine, and group and institutional practice have loomed up as elements to be reckoned with. Many physicians, it is to be feared, have quite unconsciously tolerated on the part of groups and institutions with which they are connected acts which they would not for a moment have considered if they had felt that they individually were responsible for them. It has always been recognized, for instance, that "solicitation of patients" is unprofessional, and that a physician cannot ethically engage in such solicitation. Justice and fairness demand that the practice be not indulged in by physicians through groups or institutions with which they may be connected, any more than it would be indulged in by such physicians acting in their individual capacities. These considerations led the House of Delegates at the last annual session in St. Louis to incorporate in the "Principles of Ethics" the following, so that there might be no doubt as to the duty of groups and institutions or of the physicians connected with them:

> SEC. 4.—Solicitation of patients by physicians as individuals, or collectively in groups by whatsoever name these be called, or by institutions or organizations, whether by circulars or advertisements, or by personal communications, is unprofessional. This does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class—if any—of patients accommodated.

As may be noted, it is recognized that "institutions" which provide means for treating the sick and which have certain physical attributes which can properly be

announced may call attention to these facilities. But groups of physicians associated for any reason, in group clinics or other institutions, should conform to the restrictions governing the individual physician. For professional and quasiprofessional acts committed by such groups or institutions, the physicians connected therewith must hold themselves accountable.

A SCHOLASTIC VIEW OF BOTULISM

A critical attitude of mind toward generally received opinions is perhaps a desirable character in an adult; zeal for propagation of the faith—one's own faith—is also often considered commendable. But a combination of the two qualities sometimes produces results that make the judicious grieve. An editorial comment on "More 'Botulism'" in a recent number of the *Medical Officer*, London (June 10), is an astonishing example of the effects of mental prejudice. In reviewing an article[1] that appeared in THE JOURNAL on an outbreak of botulism in Cambridge, Idaho, the writer of the editorial quotes the list of foods eaten at the fatal meal, and goes on in somewhat questionable taste: "We are not told if the water was home-canned. Anyway, the birthday party, although no doubt an immediate success, was tragic enough in the conclusion." The concluding paragraph of the editorial reveals an imperviousness to scientific evidence which is so extreme as to be diverting:

> But the diagnosis of "botulism" in these days does not cut much ice. We are so familiar with the "trailers" that follow and the "scouts" that precede our influenza epidemics, with all the symptoms of "sausage poisoning" that we are chary of accepting that unconvincing and unaerobic bacillus which Van Ezmergen [Van Ermengem is doubtless meant] "discovered" twenty odd years ago. It is so much more probable and likely that all the reported examples of so-called botulism were case-to-case, and not food infection, that they were examples of stupor, of lethargy, of polio-enceplado-myelitis, of encephalitis lethargica—call them what you will. At any rate in this instance we feel that there is some possibility of excusing the home-canned food; nor is this the first time that epidemiologists have been nauseated by the insistence by avid writers on their discovery of new and rare diseases.

The view so confidently and naively expressed in this paragraph is held by a small but scriptorially active group in England. This is not the place for a critical discussion of the somewhat tenuous hypothesis that would attribute influenza, epidemic encephalitis, botulism and poliomyelitis to a single "epidemic constitution." But we can at least point out that the airy dismissal of botulism as a figment of the imagination has never been preceded by any serious critical discussion of the numerous comprehensive investigations of botulism carried out in this country during the last decade. Before such immature views as those expressed in the *Medical Officer* can receive anything more than indifferent and amused attention, they must be based on something more substantial than innuendo and scholastic word-juggling. The grotesque misconceptions about botulism shown by the writer of the editorial cited; indeed, the sheer ignorance of epidemiologic and bacteriologic evidence, do not encourage much confidence in the speculations that are responsible for the attempt to deny botulism a place in the list of specific affections. Such views as expressed are all the more reprehensible, appearing, as they do, in a publication devoted to the enlightenment and interests of public health officials.

1. Whiteman, R. T., and Wilkinson, E. A.: Outbreak of Botulism at Cambridge, Idaho, J. A. M. A. **78**: 1278 (April 29) 1922.

Association News

BUREAU OF LEGAL MEDICINE AND LEGISLATION

Complying with the request made by the Council on Health and Public Instruction, the House of Delegates of the American Medical Association, at the St. Louis Session, authorized the Board of Trustees to take over from the Council its medicolegal and legislative work and to organize a bureau through which such work shall be carried on. The Board announces the appointment of Dr. William C. Woodward as Executive Secretary of the Bureau. Dr. Woodward's experience in public life, as health commissioner of the District of Columbia and later of Boston, and his legal training have especially fitted him for the position.

The functions of the Bureau of Legal Medicine and Legislation are: (1) To keep in touch with federal and state legislation relating to medicine and public health; (2) promptly and intelligently to advise interested state associations and component societies concerning medical legislation and, so far as practicable, to cooperate with them in such proper action as they may take; (3) to study the circumstances under which threatened actions for malpractice arise, with a view to devising methods, if possible, of reducing the frequency of such actions; of rendering defense—or compromise, if that be indicated—more equitable and effective; and of procuring relief and redress in actions inaugurated and carried on without probable cause; (4) to study and advise generally with respect to legal and legislative matters of concern to the science of medicine and to the medical profession.

The problems which will come up will be many and intricate and their satisfactory solution will depend on proper organization and operation of the Bureau. Success will depend also on the whole-hearted support and cooperation of the profession, which is earnestly requested in this effort of the Association to benefit its members and the general public.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Revocation of Licenses.—It is reported that the state board of medical examiners has revoked the license of Frederick Nathaniel Staples, on a charge that he was guilty of having been party to a criminal abortion, resulting in death.——It is also reported that the board revoked the license of Charles E. Marsh, a naturopath, on a similar charge.

Arrest of Medical Impostor.—It is reported that a person using, at different time, the names Leslie Hollen, Leslie Powell, J. Mitchell Palmer and Thomas Holland, was arrested recently in Los Angeles, on a charge of passing bogus checks and of having forged names of reputable physicians to prescriptions for narcotics. He asserted that he had practiced medicine in New York and Philadelphia. He claimed also to have been a major in the army.

CONNECTICUT

Personal.—Dr. Marvin Z. Westervelt, who has recently been in charge of the employee health service of the Winchester Arms Company, New Haven, has been appointed superintendent of the Staten Island Hospital, Tompkinsville,

N. Y.—Dr. Thomas F. O'Loughlin has been appointed health officer of Vernon to fill out the unexpired term of Dr. Wright B. Bean, who resigned recently.

Yale Medical Alumni Association.—At the annual meeting of the association at New Haven, June 19, it was voted to change the name of the organization to "The Association of Yale Alumni in Medicine," and to admit all Yale physicians, whether graduates of the Yale Medical School or other departments of the university. It was announced that the class of 1922 has agreed to contribute $3,000 to the school in ten annual instalments of $300, the money to be used as loans to worthy students. This will be known as the "Loan Scholarship Fund, Class of 1922." The following officers were elected: president, Dr. Charles E. Farr, New York; chairman of the executive committee, Dr. Herbert K. Thoms, New Haven, and secretary-treasurer, Dr. Simon B. Kleiner, New Haven.

DELAWARE

Medical Examiners Appointed.—Governor Denney has reappointed Drs. Presley S. Downs, Dover; Henry W. Briggs, Wilmington; Edwin S. Anderson, Dover, and Abram E. Frantz, Wilmington, as members of the state board of medical examiners.

DISTRICT OF COLUMBIA

Child Health Demonstrations.—The Commonwealth Fund will finance a child health program in three typical cities for a period of five years. The general qualifications of the first city to be selected are that it shall be from 15,000 to 25,000 in population, with an infant mortality of approximately 100 per thousand live births, or greater. Announcement of this action was made, June 29, by Courtenay Dinwiddie, executive secretary of the Child Health Committee for the Supervision of Three Child Health Demonstrations, Washington. The program will comprise safeguarding the health of the expectant mother, laying a good health foundation for children in the early sensitive and formative period of their growth, and health supervision and the formation of the essential health habits in schoolchildren. The responsibility for carrying out this comprehensive child health program is placed on the American Child Hygiene Association and the Child Health Organization of America. A joint committee has been formed that will have charge of all general policies, consisting of Dr. Philip Van Ingen and Dr. Richard A. Bolt of the American Child Hygiene Association; Dr. L. Emmett Holt and Miss Jean of the Child Health Organization of America; Dr. Livingston Farrand and Courtenay Dinwiddie of the National Child Health Council; Dr. Donald B. Armstrong of the National Health Council, and Mr. Barry Smith and Miss Quin of the Commonwealth Fund. An office will be opened at 532 Seventeenth Street N. W., Washington, and active work will begin at once. It was decided by the committee at their first meeting that the first city to be assisted will be selected from the upper half of the Mississippi Valley region. Two other cities are to be selected in other sections of the country after work has been well started in the first. The work will be so developed as to enlist the cooperation of physicians, public health nurses, school nurses and all other persons and agencies interested in health and child welfare in the communities selected.

FLORIDA

License Revoked.—The Tampa *Tribune* states that the license of Dr. Riley C. Hammers, former Tampa physician, was revoked at a session of the state medical examiners' board, June 13. This is the first time that a physician's license has been revoked by the examining officers of Florida, it is stated. Dr. Hammers has served several terms in prison for rape and violation of the Harrison Narcotic Law.

GEORGIA

Atlanta Graduate School of Physicians and Surgeons.—The formal opening of the Atlanta Graduate School of Physicians and Surgeons will take place in the fall. The general offices of the school are located in Grady Hospital. In addition to the city hospital, practically every private sanatorium in Atlanta will be affiliated with the graduate school. Dr. William Perrin Nicolson has accepted the office of dean, and Dr. Michael Hoke has accepted the position as president of the faculty. Dr. Garnett W. Quillian is vice dean and Dr. Frank L. Eskridge is proctor for the faculty. The executors of the estate of the late Albert Steiner have definitely agreed to erect two new buildings for the Grady Hospital, one to be a modern outdoor clinic building, which will be used exclusively by the visiting staff for the care of white patients, and the other to be devoted exclusively to the study, diagnosis and treatment of cancer. The first course offered at the graduate school will be one in orthopedic surgery and, following that, courses in general and abdominal surgery, gynecology and obstetrics, internal medicine, eye, ear, nose and throat, pediatrics, dermatology, neurology, urology and oral surgery.

ILLINOIS

Child Health Clinic.—A medical clinic for physical defects and underweight children was held in Bloomington, June 20, by Dr. George T. Palmer, president of the Illinois Tuberculosis Association, and Dr. Robert H. Hayes, Chicago.

Personal.—Dr. Willis T. Zeigler, Canton, has been elected county physician of Fulton County to succeed Dr. Jasper M. Adams.——Dr. Nelson A. Lowry, Chicago, addressed the final meeting of the Peoria City Medical Society, June 15, on the subject of "Paravertebral Anesthesia."——Dr. Daniel N. Eisendrath has returned to Chicago after a two years' stay abroad.

Hospital News.—A twenty-five room addition will be erected at the Burlington Hospital.——Construction work will begin immediately on the Mary Davier Hospital at La Harpe. ——Plans are being revised for the South End Hospital building, Chicago, which will be erected at a cost of $300,000. ——A new $130,000 building will be erected for Memorial Hospital, Harvey, Cook County.——A new laboratory will be established at the Galesburg Cottage Hospital.

Chicago

Physicians Club Elects.—At the annual meeting of the Physicians Club, held July 1, the following officers were elected: secretary, Dr. Frederick C. Test; directors for one year, Dr. Truman W. Brophy, Dr. A. A. Goldsmith, Dr. A. A. O'Neill; and director for two years, Dr. John E. Rhodes, Dr. Arthur M. Corwin and Dr. Henry T. Byford.

Rush Alumni Honor Professor Haines.—At the annual banquet of the Alumni Association of Rush Medical College, Prof. Walter S. Haines was presented with a watch in which was engraved a statement recognizing his fifty years' service in medical teaching. At the same time the Alumni Association announced the establishment of a Walter S. Haines Fund for the college library, the subscriptions to be completed within four years, at which time Professor Haines will have completed fifty years' service in Rush.

LOUISIANA

Physician Gives Donation to University.—Dr. Leon L. Solomon, New Orleans, has announced that he will give the University of Louisville the sum of $500 annually, for use in the medical research laboratory of the university. This fund will be known as the Solomon Fund.

Measure to Aid Records.—Senator Doussan's bill providing for a fee of 25 cents to be paid to physicians, midwives and other persons required to issue birth and death certificates passed the Senate, June 19. It was stated by Senator Doussan that the payment of the fee would probably encourage negro midwives in the parishes to report births.

Maternity Bill Opposed.—After prolonged arguments for and against the measure, the Senate Committee of Health and Quarantine, June 21, reported unfavorably on representative Dymond's maternity bill, which provides that Louisiana give its assent to the Sheppard-Towner maternity bill. Senator E. H. Robert, New Orleans, argued in favor of indefinite postponement of the bill and pointed out that the states of New York, Massachusetts, Maryland and Maine had rejected the bill.

MAINE

Physician Fined.—It is reported that Dr. Alexander C. Hagerthy, for many terms mayor of Ellsworth, was tried in the District Court, June 13, charged with illegal possession of twenty cases of whisky. Dr. Hagerthy was fined $500 and costs, and about $15,000 worth of liquor found in the cellar of his residence was confiscated.

Maine Medical Association.—At the annual meeting of the association held at Portland, June 26-28, under the presidency of Dr. Addison S. Thayer, Portland, the following officers were elected for the ensuing year: president, Dr. Langdon T. Snipe, Bath; president-elect, Dr. Charles A.

Moulton, Hartland; first vice president, Dr. John W. Nichols, Farmington; second vice president, Dr. Walter N. Miner, Calais, and secretary-treasurer, Dr. Bertram L. Bryant, Bangor. The next meeting will be held at Houlton, June 12-14, 1923. Dr. Olin West, Chicago, traveling secretary of the American Medical Association, and Dr. Channing Frothingham, Boston, gave addresses.

MARYLAND

Hess Dispensary Completed.—The new medical and orthopedic dispensary in connection with the Hebrew Hospital has been completed, and clinics, which will be housed there, will be in operation within the next few weeks. The dispensary is a gift to the hospital by Morton Samuels and is known as the Hess Dispensary, in memory of Mrs. Samuel's parents.

Diphtheria Immunization Clinic Opened.—The school of hygiene and public health of Johns Hopkins University, in cooperation with the department of health of Baltimore city, has opened a diphtheria immunization clinic, which will be conducted during the months of July and August. It offers to any physician the privilege of recommending any family in his practice for admission, when immunity produced by toxin-antitoxin can be brought about before the diphtheria season is here.

Personal.—Dr. J. H. Mason Knox, Jr., of Baltimore, has accepted appointment as chief of the state bureau of maternity and child hygiene, created at the last session of the legislature under provisions of the Sheppard-Towner Act. Dr. Knox is now in Europe, where he is directing child hygiene work for the American Red Cross, with headquarters at Paris. He is at present at Riga, Esthonia, from which place he cabled acceptance to Dr. John S. Fulton, secretary of the state department of health.——Dr. T. Capsar Gilchrist, Baltimore, sailed on the steamship *La France* for England and will spend the next two months traveling abroad. Dr. Gilchrist will deliver the annual address before the London Dermatological Society, July 13, in London.——Dr. Richard Follis, Baltimore, has sailed for Europe and will spend his time traveling through England and on the continent, returning September 20.

MISSOURI

Personal.—Dr. C. H. Wallace, St. Joseph, has been appointed a member of the welfare board by Mayor McInnch to succeed Dr. Daniel Morton, who declined reappointment. ——Dr. J. E. Jordan, Columbia, was presented with a gold watch as a token of esteem recently by the Boone County Medical Society. Dr. Jordan is retiring from practice owing to injuries received in an automobile accident last fall.—Dr. William P. Fischer, Columbia, has been elected secretary of the Boone County Medical Society to succeed Dr. Jordan. ——Dr. J. W. Boger, Sedalia, has been appointed county health officer of Pettis County.—Dr. Henry L. Wilfner, St. Louis, has resigned from the board of education after nine years of service.——Dr. Edward S. Smith, Macon, has been selected one of twenty officers to be sent to Harvard University for a special course in medicine.

MONTANA

State Medical Meeting.—The annual meeting of the Medical Association of Montana will be held at Great Falls, July 12-13, under the presidency of Dr. Wyman W. Andrus, Miles City. Dr. Joseph C. Bloodgood, Baltimore; Dr. Ernest M. Hammes, St. Paul; Dr. David S. Hillis, Chicago; Dr. Leonard G. Rowntree, Rochester, Minn., and Dr. Dean Lewis, Chicago, will be among the visiting physicians who will gives addresses.

NEW JERSEY

Medical Society of New Jersey.—At the one hundred and fifty-sixth annual session of the society, held in Spring Lake, June 20-22, under the presidency of Dr. Henry G. Costill, Trenton, the following officers were elected for the ensuing year: president, Dr. James Hunter, Jr., Westville; vice presidents, Drs. Wells P. Eagleton, Newark, Alexander MacAlister, Camden, and Archibald Mercer, Newark; secretary, Dr. William J. Chandler, South Orange, and treasurer, Dr. Elias J. Marsh, Paterson.

Aid for Unwedded Mothers.—A conference was held in Trenton recently, under the auspices of the bureau of child hygiene and the state board of health, to consider means for extending the work in regard to problems relating to unwedded mothers, including their care and that of their children. A plan was proposed to enlist the cooperation of the general public, especially the women, so that it may be possible for illegitimate children, of which there are approximately 1,000 a year born in New Jersey, to have a "square deal."

NEW YORK

Personal.—Dr. Haven Emerson has been appointed full-time professor of the department of public health administration at Columbia University, New York, by the board of trustees of the university.——Following his retirement from active service at the Harlem Hospital, Dr. Irving S. Haynes was tendered a complimentary dinner by members of the medical board of the New York Athletic Club, June 8.——Dr. Alec N. Thomson, director of medical activities of the American Social Hygienic Association, New York, has been appointed to the staff of the committee on dispensary development of the United Hospital Fund, New York.

Camp for Pertussis Patients.—The Riverside Convalescent Camp on North Brother Island, for patients suffering from whooping cough, was opened, June 26, by the New York City Health Department. It will be under the direction of Dr. Robert J. Wilson, director of hospitals for the department, and Dr. Thomas Joyce will be in direct charge. At the present time, there are about 500 children in the city afflicted with this disease, and very few of the hospitals in the city have provisions for caring for them while they are convalescent. In the new camp, there are accommodations for 2,000 children, who will be kept there for a period of six weeks or longer without expense to their parents.

Change in Compensation Law.—The following amendments have been made to the Workmen's Compensation Law, effective July 1, 1922:

Explanation: Matter in *italics* is new; matter in parenthesis is old law (to be omitted).

Article 2, Section 13. Treatment and care of injured employees. The employer shall promptly provide for an injured employee such medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches and apparatus *for such period* as the nature of the injury *or the process of recovery may require* (during sixty days after the injury; but the commission may, where the nature of the injury or the process of recovery requires a longer period of treatment require the same from the employer). If the employer fail to provide the same, after request by the injured employee, such injured employee may do so at the expense of the employer. The employee shall not be entitled to recover any amount expended by him for such treatment or services unless he shall have requested the employer to furnish the same and the employer shall have refused or neglected to do so, or unless the nature of the injury required such treatment and services and the employer or his superintendent or foreman having knowledge of such injury shall have neglected to provide the same; *nor shall any claim for medical or surgical treatment be valid and enforceable, as against such employer, unless within twenty days following the first treatment, the physician giving such treatment, furnish to the employer and the industrial commissioner a report of such injury and treatment, on a form prescribed by the industrial commissioner.*

New York City

Personal.—Dr. Harold W. Hersey has resigned as head of the New Haven Hospital to take a position on the administrative board of Columbia University and the Presbyterian Hospital.——Dr. Thomas H. Cherry and Dr. Julius Auerbach sailed for Europe on the American Liner *Resolute*, June 27. ——Dr. and Mrs. Russell A. Hibbs sailed for Europe on the *Celtic*, July 1.——Dr. and Mrs. David Hunter McAlpin, Dr. Frederic E. Sondern and Dr. Samuel S. Gant sailed for Europe on the *Homeric* of the White Star Line, July 1.—— Health Commissioner Dr. Royal S. Copeland sailed for Europe on the *France*, June 28, in order to obtain first hand information as to health and sanitary conditions abroad. His ultimate destination is Poland, where he will spend several weeks investigating conditions in the typhus-infected district. He is representing the city of New York at the International Congress for the Protection of Mothers and Infants held in Paris, July 6 to 8.

Hospital News.—The eleven-story addition to the Broad Street Hospital was formally opened, June 19. The institution has accommodations for 100 patients. The Grand Lodge of the State of New York finances the Masonic floor; the seventh floor will be known as the Roosevelt Memorial floor, for children, and will be financed by William Hamlin Childs. Mrs. James Barber will finance another floor, which will be known as the Nora Nickle Barber Maternity floor. For the maintenance of the hospital, every business firm south of Chambers Street will be asked to contribute a stated sum annually. Every firm may protect its employees by paying $1 a year per person, with a minimum of $25. During the past five weeks, 115 firms, with a total of 15,000 employees, have taken out this form of "health insurance."——The Montefiore Hospital for Chronic Diseases has purchased a plot 50 by 100 feet adjacent to its home on Gun Hill Road

and also acquired a lot, 125 by 100 feet, on the east side of Steuben Avenue. The hospital recently bought five lots adjoining the latter purchase on the north.

OHIO

Hospital News.—A tuberculosis sanatorium will be erected at Cleveland exclusively for Jewish people.——Plans to issue bonds for $300,000 for a new building at the Flower Hospital, Toledo, have been made.

Physician's License Restored.—The license of Dr. Alfonza Aratus of Cincinnati, which was revoked in 1909 in Ohio and in 1917 in Kentucky, was restored in the state of Ohio in December, 1917, according to a recent report.

Ohio Licenses Revoked.—The license of W. H. Blanck, Cleveland, is reported to have been revoked on the ground that he is now serving a term in the penitentiary for committing an alleged abortion.——The certificate of J. D. Clyne of Cleveland, alleged abortionist, has likewise been revoked.——The certificate of M. Lowenthal, Cleveland, was revoked on the ground that he was convicted of violation of the Harrison Narcotic Law, as a result of which he was sentenced to four years in the penitentiary and fined $2,000.——The certificate of Katherine Kolling, a midwife, Cleveland, was revoked on the ground that she was serving a term in the penitentiary for alleged abortion.——The certificate of S. E. Zeigler of Akron was revoked on the ground that he had been convicted of violating the Harrison Narcotic Law.

Personal.—Dr. John M. Withrow, Cincinnati, received the honorary degree of doctor of laws at the eighty-third annual commencement of Miami University, in recognition of his work in the interests of the public schools in Cincinnati.——Dr. Felix T. Revailles of the Ohio Hospital for Epileptics, Gallipolis, was knocked down and badly beaten, and four patients were stabbed, while trying to subdue a patient who ran amuck recently.——Dr. H. H. Goddard has resigned as director of the state bureau of juvenile research, and Dr. Edmund M. Baehr, psychiatrist for the department of welfare, has succeeded him. Dr. Goddard will become professor of abnormal psychology at Ohio State University in the fall.——Dr. Carl L. Mueller, health commissioner of Wapakoneta, has been elected secretary of the newly organized Auglaize County Public Health League.——Dr. Frank D. Phinney, Cincinnati, has been made a citizen of the United States. Dr. Phinney immigrated from Canada in 1895.——Dr. Edgar J. Curtiss has been appointed physician for the Allen County Children's Home, to succeed Dr. Jonathan B. Vail, resigned.

OKLAHOMA

University of Oklahoma.—During the year 1921, improvements were made at the University of Oklahoma Medical School, Norman, in the way of remodeling, at an expense of $6,000,000. An additional building was provided for the University Hospital at a cost of $75,000, which increased the capacity from 176 to 276 beds, and a nurses' home was erected at a cost of $60,000. The legislature provided an appropriation of $20,000 for radium. As the hospital is directly under the management of the school of medicine, all of these improvements add to the facilities of the school.

OREGON

Pacific Northwest Urological Association.—This organization was recently formed, composed of specialists in urology, with Dr. Albert E. MacKay, Portland, president; Dr. Eric W. Boak, Victoria, B. C., vice president, and Dr. William J. Pennock, Spokane, secretary-treasurer.

PENNSYLVANIA

Hospital News.—Reading Hospital has sold its building for $600,000 and a site for $100,000, and $1,000,000 is now available for a new building.——An addition to Mount Sinai Hospital, Philadelphia, doubling the capacity of the institution, was formally opened and dedicated, June 25. Judge Patterson delivered the dedicatory address. A feature of the new addition is an animal experimentation laboratory, which is maintained by the Federation of Jewish Charities, for scientific research and investigation in connection with its social welfare organizations. The new houses adjoining the hospital will be purchased in the near future and the hospital will occupy the entire block.

Medical Extension Service.—Establishment in the near future of a state-wide medical extension service, as a result of the efforts of leaders in the medical profession, was forecast, June 14, at a meeting of the Philadelphia County Medical Society. Dr. George H. Meeker, dean of the graduate medical school of the University of Pennsylvania, is one of the principal sponsors of the plan, according to Dr. James M. Anders, who referred to its possibilities and value in a paper on "Some Deficiencies of Modern Therapeutics." This will enable physicians who, busy with their practices, have not kept in touch with the latest achievements by fellow-members of their profession, or with discoveries and improved methods in its every branch, to be kept constantly informed through the extension service, which will have branches in practically every hospital of the commonwealth.

Philadelphia

Medical Agent Charged with Graft.—It is reported that after county detectives had listened through a dictaphone for several hours, while Dr. Louis Saltzmann, an agent of the state bureau of medical licensure, bargained with an official of the County Chiropractors' Association, he was arrested, June 10. The Council for the Philadelphia County Chiropractors' Association complained to the district attorney that Dr. Saltzmann was trying to extort money from the chiropractors by promising not to prosecute them for violation of the medical practice laws. The chiropractors declared that the association has paid Saltzmann $150 a month for several months not to prosecute them. The bureau of medical licensure stated that he had been employed by them as a detective to gather evidence against persons believed to be practicing without a license.

RHODE ISLAND

Rhode Island Medical Society.—At the annual meeting of the society, held in Providence, June 1, under the presidency of Dr. George S. Mathews, Providence, the following officers were elected for the ensuing year: president, Dr. Frank E. Peckham, Providence; first vice president, Dr. Arthur T. Jones, Providence; second vice president, Dr. William F. Barry, Woonsocket; treasurer, Dr. Winthrop A. Risk, Providence, and secretary, Dr. James W. Leech, Providence.

SOUTH CAROLINA

Public Health Lectures.—In the monthly report of County Health Commissioner Chimene, it is stated that fifteen public health lectures were given during the month of May in Greenville, with an estimated number of 1,045 persons in attendance. Three hundred and fifty children were examined, and motion pictures were exhibited at the mills on the subject of prevention of venereal disease.

Personal.—Dr. J. Baxter Haynes, Spartanburg, and Dr. J. S. Matthews, Denmark, have been appointed members of the state board of medical examiners.——Dr. Washington P. Timmerman has been elected president of the Batesburg Board of Trade and of the newly organized Batesburg Medical Society.——Dr. Charles W. Kollock was elected president of the Charleston Tuberculosis Association recently.

TENNESSEE

Orthopedic Clinic.—A new department of the health center of Knoxville was opened June 15, for the treatment of orthopedic cases. Any person in the city suffering from a disease or deformity which may be relieved by orthopedic treatment, and who is unable to pay for the treatment, may secure remedial treatment at the health center.

TEXAS

Hospital News.—The Spohn Hospital of Corpus Christi, which was destroyed by a storm in 1919, has completed its fund for rebuilding on a large and modern plan. Meanwhile, the hospital continues work in a building, with its regular corps of Catholic sisters.——The Ranger City and County Hospital, Ranger, is under construction and will be completed about October of this year. The institution will have a forty-two bed capacity and will be of fireproof construction.

UTAH

New Appointments.—Dr. Clarence C. Jensen, state superintendent of public instruction, Riverton, has been appointed state director of health education, to succeed Dr. Ephraim G. Gowans, Salt Lake City, who resigned recently.——Dr. Douglas L. Gamette, Salt Lake City, has been appointed house surgeon at St. Mary's Free Hospital for Children, New York City.

WISCONSIN

University of Wisconsin.—Appointment of a committee of the regents and faculty of the University of Wisconsin to consider problems growing out of the proposed construction of the $1,350,000 Wisconsin General Hospital in connection with a four-year medical course of the university has been made. This committee will investigate and report to the governor on questions which he wishes answered before authorizing construction.

Triple Ownership Plan for Sanatorium.—At a meeting of the tri-county sanatorium committee, representing delegates from Fond du Lac, Winnebago and Waushara counties, final details of the triple ownership plan for Sunny View Sanatorium, near Oshkosh, were agreed on. Winnebago is erecting a Hick Memorial Nurses' Home near Sunny View and the county has agreed to permit the nurses of the Sunny View Sanatorium to use the nurses' home.

CANADA

Hospital News.—Plans have been requested for the establishment of a sanatorium, in Ontario, to be erected at a cost of $1,000,000, for the treatment of tuberculous members of the Brotherhood of Railway Trainmen.——At a recent meeting of the Kiwanis Club, in Quebec, two huts were presented to Laval Hospital for the use of tuberculous children during the summer months. Premier Taschereau accepted the huts on behalf of the hospital.

PHILIPPINE ISLANDS

Philippine Islands Medical Association.—At the annual meeting of the association held in Manila, under the presidency of Dr. Baldomero Roxas y Luz, the following officers were elected for the ensuing year: president, Dr. Harry H. Steinmetz; first vice president, Dr. Aristeo R. Ubaldo; second vice president, Dr. Daniel de la Paz; councilor for five years, Dr. Vicente de Jesus De Zabala, and secretary-treasurer, Dr. Isabelo Concepción.

GENERAL

Russians Honor American.—A delegation of sixty, representing the various Russian organizations in Greater New York, met the body of Harold F. Blandy, the first American relief worker to die in Russia from typhus, when it arrived on the *Polonia*, June 23, from Libau.

American Psychiatric Association.—At the annual meeting of the association held in Quebec, Canada, June 6-9, the following officers were elected for the ensuing year: president, Dr. Harry W. Mitchell, Warren, Pa.; vice president, Dr. Thomas W. Salmon, New York, and secretary-treasurer, Dr. Clarence Floyd Haviland, Albany, N. Y.

American Neurological Association.—The American Neurological Association at the annual meeting at Washington, D. C., elected Dr. Harvey Cushing, Boston, president of the society. Other officers elected were: Drs. Herman H. Hoppe, Cincinnati, and Charles S. Potts, Philadelphia, vice presidents, and Dr. Frederick Tilney, New York, secretary-treasurer.

American Urological Associaion.—At the annual meeting of the association held at Atlantic City, May 26-28, the following officers were elected for the ensuing year: president, Dr. Henry L. Sanford, Cleveland; vice president, Dr. James A. Gardner, Buffalo; secretary, Dr. Homer G. Hamer, Indianapolis, and treasurer, Dr. James B. Cross, Buffalo. The next annual meeting will be held at Rochester, Minn .

Report of Infant Mortality.—The American Child Hygiene Association has published its third annual report of infant mortality in cities of over 10,000 population in Continental United States. Data were sought only from cities in the death registration area, and of these, 573, covering 94.4 per cent. of the population, are included in the report. A remarkable reduction in infant mortality throughout the country is shown. In cities of over 250,000 population, the infant mortality rate dropped from 89.0 in 1920 to 75.3 in 1921. The rate in cities with a population between 10,000 and 25,000 dropped from 93.8 in 1920 to 82.3 in 1921. The rate for all cities in the area dropped from 91.5 to 77.9. Of the cities included in the report having more than 250,000 people, Portland, Ore., San Francisco, and Seattle had the lowest infant mortality rate; Pittsburgh, Kansas City, Mo., and Buffalo had the highest rates.

National Health Council Issues Report.—The U. S. Bureau of Animal Industry is concerned chiefly with the welfare of animals. Much of the work of this bureau, however, relates to human health. In order to present a brief outline of the activities of the bureau, the National Health Council has issued a mimeographed report setting forth the legal authority, history and development of the bureau, its organization, personnel and appropriations, and its cooperation with other agencies. It is the eighth in a series concerning the health activities of the United States government which has been issued by the council. It is planned in the near future to combine all of these reports in a single printed pamphlet, thus offering for the first time correlated and accurate information concerning the public health work of the United States government. Copies of the report on the Bureau of Animal Industry, or of any of the other reports, may be obtained without charge from the Washington office of the council, Seventeenth and D streets N. W., Washington, D. C.

Nursing Education Program.—A program of nursing education that seems to have the unanimous support of the physicians, nurses and public has been effected recently. For three years, a committee has been studying the problem, which began with the question of the proper training of public health nurses. The personnel of this committee consisted of Dr. C. E. Winslow, professor of public health, Yale University Medical School, New Haven; Dr. Welch, Johns Hopkins University, Baltimore; Dr. Edsall of Harvard, Boston; President Farrand of Cornell, Ithaca; Commissioner Biggs; Dr. L. Emmett Holt, and Dr. Conner, New York, and others. Unanimous recommendations urge three grades of nursing service: (1) the trained registered nurse for the care of the acutely ill, the present training course to be reduced 20 per cent. in length (that is, to two years and four months), but with such improvement as not to lower present standards; (2) the public health nurse, the supervisory nurse and the teacher in schools of nursing, who shall receive specialized graduate training beyond the standard course, and (3) the subsidiary nursing worker, who shall be trained in a course of eight or nine months and be licensed as a "nursing aid" or "nursing attendant" for the care of minor and chronic illness and convalescence. Thus, it is proposed to maintain the present "R. N." standards, and at the same time to give further protection to the public through standardizing the subsidiary type of nurses under a description that will not be distasteful.

Bequests and Donations.—The following bequests and donations have recently been announced:

Children's Free Hospital Fund, Wisconsin, $128,962, as final payment of the $150,000 pledge, by the Ferdinand Schleisinger estate.

Youngstown Hospital Association, Youngstown, Ohio, $100,000 for a maternity ward, to be known as the Grace Todd Arrel Maternity Ward Trust Fund, by the will of Mrs. Grace Todd Arrel.

Madison, Wis., for the establishment of a hospital to be conducted by the Norwegian Lutheran Church of America, $50,000, on condition that $100,000 is raised in six years by the church, to be donated by Torger G. Thompson.

Methodist Episcopal Hospital, Brooklyn, and the General Hospital Society of Connecticut, $25,000 each, by the will of William P. Armstrong.

Flushing Hospital, Flushing, L. I., $25,000, by the will of Mrs. Angeline M. Booth.

Grinnell Community Hospital Association, Grinnell, Iowa, about $25,000, on the death of her sister, by the will of Sophronia G. Turner.

Woman's Medical College of Pennsylvania, Philadelphia, $21,000, the income to be used for scholarship purposes by the will of Dr. Emma Culbertson of Boston.

Jewish Convalescent Home, Torresdale, Pa., $15,000; an initial donation of $10,000 by Joseph B. Fursman to build a separate wing for cardiac cases, and $5,000 that was contributed at the annual meeting of the directors.

Fifth Avenue, Broad Street and the Lenox Hill hospitals, New York, and the Sisters of the Poor of St. Francis and St. Vincent's hospitals, each $5,000, by the will of Nicholas Rath.

Barton Dispensary, Philadelphia, approximately $1,000 in pledges, by the alumnae of the Woman's Medical College of Pennsylvania at their annual meeting.

Hollywood (Calif.) Hospital Association, $500, anonymously.

Sisters of St. Mary, Baraboo, Wis., property for a hospital, by Mrs. Della Ringling of Baraboo.

For the benefit of humanity, the residue of her estate and forty acres of her farm near Warrenton, Ore., for a public park in memory of her parents, on her death, by Dr. B. A. Owens-Adair.

Department of Labor.—Secretary of Labor Davis in a communication to Surgeon General Cumming of the U. S. Public Health Service requests full information as to the legislation necessary to secure a thorough physical examination of every alien who is admitted to the United States through the immigration ports. Secretary Davis also announced his intention of recommending to Congress the enactment of such legislation at the earliest possible moment. His communication reads in part as follows:

The protection of the health of American citizens against disease carried by incoming aliens is of the utmost importance and, it seems to me, should be thorough at every port. I note in your recent statement that Ellis Island, N. Y., and Angel Island, Calif., are the only immigration stations that have satisfactory facilities for a thorough medical examination. Surely Seattle and Boston are important ports, where many aliens enter, and these should be medically in the same

class with Ellis Island and Angel Island. I am assuming that all ports have equipment which will make thorough examinations possible, but that the want of equipment at some of the smaller ports merely requires a longer time to complete an examination, and that additional equipment at the larger ports facilitates examination. In the final analysis, loathsome contagious diseases are as dangerous to American citizens when coming through a small port as when coming through a large port. It is barely possible that those afflicted with diseases, knowing that the examinations at the smaller ports are not so thorough, seek the smaller ports for entrance. The subject of examination of seamen seeking shore leave I think requires immediate and thorough attention. The privilege of shore leave applies to all seamen, including even the races which are barred as immigrants and the zones from which the immigrants may not come. Seamen in the very nature of things touch some time or other all the ports of the world and thus are more likely to be carriers of disease than are immigrants. If there is no provision in the law for thorough examination of seamen who seek shore leave, the provision should be made therefor. Will you be good enough to give me a full and detailed statement of what is necessary by way of either legislation or appropriation, so far as you know, in order to secure a thorough examination, medically, of every alien who enters the United States at any port anywhere? Also, kindly indicate to me, if you will, the scope of legislation, so far as your own bureau is concerned, for extending the service, so that I may know what legislation should be provided in connection with this department. Also kindly let me know what provision by way of appropriation for the extension of the service is made in connection with your service, so that I may know what recommendations to make for extending the service so far as this department is concerned. I should appreciate it if you would give me this report as soon as possible, so that I may have it when preparing my report to the President and to Congress for the fiscal year ending June 30, 1922.

FOREIGN

Postgraduate Work in Vienna.—A cablegram just received from Dr. Kettelkamp, Secretary of the American Medical Association of Vienna, states: "The unhappy conditions set forth in our letter of March 14 have been adjusted. Postgraduate work in Vienna is on pre-war basis."

Bust Presented to Thibierge.—The retirement of Dr. G. Thibierge from his dermatologic service at the Hôpital Saint-Louis at Paris was the occasion of the presentation of a bronze portrait bust, and tribute from numerous speakers who lauded not only his scientific work but his leadership in organization, and skill in teaching.

Cancer Research Committee.—The minister of hygiene in France has organized a special commission to coordinate the efforts and research in regard to the etiology, clinical study, treatment and prophylaxis of cancer. Dr. E. Roux of the Pasteur Institute is the honorary president of the commission, and Prof. Quénu is the acting president. The commission includes a large number of clinicians and workers in these lines.

University News.—At the annual commencement of the Mukden Medical College, Dr. Dugald Christie, principal of the university, gave the opening address. It was announced that, in 1924, through the generosity of Sir Joseph Maclay, former British shipping controller, the Mukden Medical College will be open to women students. The Rev. Dr. Webster addressed the students and opened a new outpatient department of the Mukden Hospital, which is attached to the college of medicine.

Infant Welfare Conference.—The week of July 3-8 will be known as Baby Week in London. The object is to further the child-adoption movement for Great Britain. Until the present time, legal adoption of children in that country could not be carried out, and the new propaganda aims at enactment of laws to legalize such adoptions. This may result in a plan for adoption of English orphan children in American families. Dr. Henry Dwight Chapin of New York, who sailed for England, June 21, will give an address at the conference entitled "An Alternative to the Institutional Rearing of Children."

Kuling Medical Association.—The summer activities of the Kuling (China) Medical Association include, Good Health Week, July 17-22; a course for educational workers and mothers, in which they will take up school inspections, simple physical examinations and corrective hygiene; a course in physical training for girls; scientific health lectures every evening during Good Health Week, by Prof. C. H. Robertson; a sanitary survey of Kuling under the direction of Dr. R. M. Atwater; a course in physical training for Chinese at Lily Valley in August, by Dr. Gray of the Y. M. C. A., Shanghai, and the annual banquet of the association, August 1.

Knighthoods for the Medical Profession.—The list of honors conferred in June, on the occasion of the king of England's birthday, contains the names of several members of the medical profession. Sir Berkeley Moynihan, who has founded the most outstanding school of surgery in the country, received a baronetcy. Knighthoods were allotted to Dr. H. Kerr Anderson, master of Gonville and Caius College, Cambridge; Prof. W. M. Bayliss, professor of physiology, University College, London; Dr. John Macpherson, professor of psychiatry, University of Sydney, Australia; Dr. Douglas Rice-Oxley, mayor of Kensington, London, and Dr. David Maurice Serjeant. In the Order of the Bath, knighthoods were given to Sir Robert Hill, director general of the medical department of the Royal Navy; Major General Klenkinsop, and Mr. Richard R. Cruise, surgeon-oculist to the king, Major A. W. Lynsdale, professor of materia medica, Madras Medical College, becomes Companion of the Imperial Service Order.

Personal.—Prof. E. Schmiegelow of Copenhagen has been elected an honorary member of the Vienna Laryngologic Society.——The *Ugeskrift for Læger* relates that Dr. T. Madsen of Copenhagen has been given the Polish decoration, Polonia Restituta.——A banquet was tendered recently to Dr. G. Marañon of Madrid to celebrate his election to the Academia de Medicina. His address on taking his chair was on the present status of the theory of internal secretions.——The Spanish Gynecologic Society recently held a special session in honor of Dr. Cospedal who is retiring from charge of the Princesa Hospital, having reached the age limit.——The *Medicina Ibera* relates that Dr. L. Recasens was the guest at a banquet given in honor of his successful competition for a post in the Beneficencia Municipal.——Prof. Martínez Vargas, dean of the Barcelona medical faculty, has been appointed senator.——The completion of forty years of university teaching by Prof. E. Maragliano is to be celebrated by the foundation of a medical library at the University of Genoa, to bear his name.

Deaths in Other Countries

Dr. **Edmund Fallows Lawson,** C. M. S., Hospital Funing, Fukien, South China, and Dr. Marcus MacKenzie, both medical missionaries from England, contracted pneumonia plague while attending the sick, and died in Foochow, recently.——Dr. **Gordon Ley,** London, gynecologist, Charing Cross Hospital, in an aeroplane accident in the English Channel, June 3.——Dr. **G. Martin,** a prominent ophthalmologist of Bordeaux.——Dr. **C. E. Mariani,** of Turin, editor of the *Archivio di Antropologia Criminale* and director of a private sanatorium. He has published a number of works on criminal psychology, teratology, psychic epilepsy, etc.——Dr. **F. Boschetti,** professor of clinical medicine at the University of Modena.——Dr. **J. W. Cardoso** of Rio de Janeiro.

Government Services

Additional Grounds for Walter Reed Hospital

President Harding, through the director of the budget, has recommended to Congress that the sum of $440,000 be appropriated for the acquisition of additional land for the Walter Reed General Hospital, Washington, D. C. The sum of $350,000 has already been appropriated by the legislative branch, but it has been found that this is insufficient to carry out the plans for securing the property in the vicinity of the institution.

Nursing Service for Disabled Veterans

Before taking its summer recess, the House of Representatives passed the pending bill providing the maximum amount to be paid disabled ex-service men requiring the constant assistance of a nurse or attendant. The sum fixed was $50 a month. Heretofore, disabled ex-service men were allowed $20 a month for a nurse or attendant. The law applies specifically to disabled veterans who are totally blind or suffering with mental diseases that do not confine them to an asylum.

Vocational School for Neuropsychiatric Cases

A resident vocational school for neuropsychiatric cases has been established by the U. S. Veterans' Bureau at Chick Springs, S. C. The institution will provide for treatment of 250 disabled ex-service men, already assigned there. A systematic course of instruction such as is feasible for neuropsychiatric patients has been established. The vocational school and hospital consists of a new building fully equipped with machinery, by which students will learn various trades, with additional facilities for medical treatment. A corps of experienced teachers has been engaged by the Veterans' Bureau to supervise the training, while physicians and nurses will look after the physical welfare of the ex-service men.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 19, 1922.

Deanglicization of the Indian Medical Service

The Indian Medical Service, which used in its upper ranks to be almost entirely recruited from Great Britain, is rapidly losing its British element. It is true that Indians were always eligible, but the very difficult competitive examination was held in London, and the Indian medical schools had not reached a level capable of turning out competitors. The Indians who competed were therefore the few who could be educated in England, and they furnished only a small minority of the service. There was a "subordinate medical service" recruited entirely from India and manned by men termed the "assistant surgeons," whose training was below the European standard, and they permanently held a subordinate rank. With the recent granting of powers of self-government to India and the improvement of its medical schools, natives have entered the medical service in greatly increased numbers. The result is that a newly appointed British officer is faced with the possibility of having to work under seniors who may be natives. This is objectionable to the ordinary Britisher, and the result is that there is greater and greater difficulty in recruiting the service from British sources. At one time the Indian Medical Service was considered a splendid field for able and ambitious young physicians. The pay was higher than that of the medical service of the British army, and, in addition, valuable civil medical appointments in India were a perquisite of the service, for there were no other physicians available. The result was that the service reached a high level and numbered many investigators who shed luster on British medicine. With the exception of Manson, all the pioneers of tropical medicine belonged to its ranks. Now the difficulty of recruiting is so great that the competitive examination has been dropped, and even British physicians cannot be induced to enter. Recruiting in England is at a standstill. If the native physicians who have taken the place of British maintain the same high standard of efficiency, nothing can be said against the change as regards the military part of their work, for that is virtually confined to native troops. But there is the difficulty that the European population of India is dependent on the service for medical attendance, and objects to be handed over entirely to natives, however skilful they may be. It was recently stated in the House of Commons that, in the country districts of Bengal, there are only five European physicians, and that of twenty-four country districts of Madras there is a European physician in only seven. The result will be that the Indian Civil Service also cannot be recruited in England, for the Englishmen cannot be expected to take their wives up country to places where they cannot call in an English physician.

Retirement of Dr. Head

A complimentary dinner was recently given to Dr. Henry Head, F.R.S., on his retirement, in recognition of his services as editor of *Brain* for seventeen years. The chair was taken by Sir Charles Sherrington, F.R.S., professor of physiology at the University of Oxford and president of the Royal Society, whose outstanding contributions to neurology are so well known. Proposing the health of Dr. Head, he said that under his direction the influence of *Brain* had been increased and extended, forming a bond between the neurologists in these islands and those across the channel and beyond the Atlantic. Every worker in neurology knew that he could get a sympathetic hearing and an opportunity from Dr. Head. He had consistently upheld the scientific method in neurology and in his own work. He had his reward in the position *Brain* had obtained as a worthy representative of British science.

Sir David Ferrier, one of the founders and original editors of *Brain*, then sketched its history. In 1877, those interested in neurology felt the need of a special journal. The reports of the West Riding Asylum, the first school of neurology in this country, founded by Sir James Crichton-Browne in 1871, came to an end in 1876. In that year, *Mind* was started by Prof. Croom Robertson, but it was concerned mainly with pure psychology. A committee consisting of Crichton-Browne, Bucknill, Hughlings Jackson and himself resolved to establish a journal devoted to the anatomy, physiology and pathology of the nervous system. The title "Brain" was selected, and the first number was issued in April, 1875. It was edited in alternate years by Crichton-Browne and Ferrier for five years. Then, Dr. de Wattevill became acting editor. He was followed by Percy Smith, and, in 1905, Dr. Head became editor. The value of the journal had been greatly enhanced by his epoch-making researches.

Dr. Head, in responding, described the early financial struggles of the journal, speaking of the constant deficit, which had to be defrayed out of the editorial pocket. By rigid economy, a condition of financial solvency was at last attained. During the war, difficulty again arose. In the early days, Dr. Head read Hughlings Jackson's papers on aphasia, and was so struck by their importance to science that he reissued them as a double number. Congratulatory letters came from all parts of the world, and Von Monakow not only translated them into French but devoted a large issue of the *Schweizer Archiv* to a critical consideration of Jackson's views, which were entirely unknown on the continent. Then Sherrington's classic paper on postural activity of muscle and nerve was published. Though the issue was sometimes delayed, the journal appeared every year during the war. But the colossal rise in the price of paper and in wages again caused a deficit. By drastic measures, financial solvency was again attained. *Brain* had become an international organ of neurology and was universally considered as representative of the serious side of English work. English neurology had influenced foreign thought because it had brought something distinctive. It had been characterized by two features—dependence on clinical observations and consistency in looking at pathologic facts from the physiologic point of view. This began in 1859, when that adventurous genius Brown-Séquard came to England. Hughlings Jackson was profoundly influenced by him. The next most serious influence on English neurology was the publication by their chairman of the "Integrative Action of the Nervous System," which reinforced the tendency always present to regard pathologic facts from a physiologic standpoint, a principle still incompletely assimilated abroad.

In closing, Dr. Head spoke of his pleasure in leaving the journal in the competent hands of his successor, Dr. Gordon Holmes.

A "Rat Barrack"

A correspondent of the *British Medical Journal* has unearthed the following ingenious method of dealing with rats, which he found in Hall's book "Ireland," published in 1841:

> Mr. Russell has a "rat barrack" on his premises. It is about 12 feet long, 6 feet broad and 4 feet high, with a coping-stone on the top that projects a couple of feet inside the wall. The inside of the wall is full of holes that just admit a rat's body, leaving the tail outside. The whole is covered with old boards. There are two passages for them to come out into the yard, where they are fed and never disturbed. The consequence is they never go into his store where the bacon is. Once every three months, he closes the holes that communicate with the yard. He uncovers the walls, and the rats all run into the holes. Their tails are hanging out. A man goes in, takes them one by one by the tails and throws them into a barrel, where they are all destroyed, to leave room for a fresh supply.

The Influenza Epidemic

The quarterly return of the registrar-general shows the severity of the influenza epidemic of the early months of the year. Influenza was a primary or secondary cause of death in no fewer than 16,888 cases in England and Wales in the first quarter of 1922, and accounted for 10.2 per cent. of the total deaths. Moreover, the total deaths were 36,204 more than in the first quarter of 1921. This is usual when an epidemic is prevalent. When persons suffering from chronic disease are stricken in the epidemic, cause of death is not given as influenza. A remarkable fact is that during the epidemic more women than men died from the disease.

PARIS

(From Our Regular Correspondent)

June 9, 1922.

De Lapersonne's Mission in America

At a recent session of the Academy of Medicine, Dr. F. de Lapersonne, professor of clinical ophthalmology of the Paris Faculty of Medicine, presented a report concerning his mission as representative of the academy at the international congress of ophthalmology, held in Washington, April 25-28. "Our friends in the great American republic," said de Lapersonne, "made elaborate preparations for the congress, as usual, and its management was perfect." After a review of the principal work of the congress, de Lapersonne spoke of various hospitals and universities that he visited during his short stay in the United States. By coming in contact with American colleagues, he was able to observe the important scientific work which is being undertaken, and which is made possible by the extensive means at the disposal of investigators in the United States. He stated that it is impossible to imagine, in France, the unlimited resources available for study and the development of private initiative. "With their tenacity of purpose and their practical minds," said de Lapersonne, "American scientists desire to become in medicine, as in other provinces, the first nation of the world." De Lapersonne believes that the results they obtain so rapidly fully justify this ambition. American professors expressed the desire to cooperate more closely with their French colleagues through the exchange of scientific works, the reciprocal publication of articles in medical journals of both countries, and the exchange of professors and students. The principal obstacle to this is the fact that few Americans speak French and that, in turn, few Frenchmen speak English. De Lapersonne believes that it is important for French children to learn English "so that they may benefit by the ever-increasing amount of interesting work coming from Anglo-Saxon races."

Edema of Larynx in Mumps

In a previous letter, I mentioned the occurrence of appendicular manifestations with mumps (The Journal, May 6, 1922, p. 1401). Edema of the larynx is another complication in mumps which seems scarcely to have attracted attention in the past. Textbooks and practical treatises on laryngoscopy do not make mention of it; but this complication appears to be more frequent than we think, as is shown by a communication presented by Drs. L. Reverchon and G. Worms to the Société parisienne de laryngologie. During six years in the otorhinolaryngology service of the military hospital of Val-de-Grâce, Reverchon and Worms observed three cases of edema of the larynx in mumps. The evolution of their two first cases was very simple, and the edema could have been considered as an ordinary clinical curiosity, interesting only on account of its infrequency. But a third case, with fatal outcome in less than five hours after admittance to the hospital, and seven or eight days after subsidence of the mumps, demonstrated that this complication can have a serious prognosis notwithstanding the usual benign course of mumps. The seat of the edema was the same in the three cases: the posterior region of the vestibule, the aryepiglottic muscle. This infiltration of the submucous connective tissue was unilateral in the first case and bilateral in the two other cases. The three cases of mumps were of submaxillary type, isolated in the first case, and with parotid mumps in the second case. Tracheotomy was not performed at once in the third case, because the patient did not present any signs of asphyxia; there was no distress or cyanosis, but he was pale and drowsy. On the other hand, laryngoscopic examination revealed that the edema did not reach the epiglottis, and the throat appeared to be sufficiently permeable. The slight dyspnea was not accompanied by laborious breathing, and the immobility of the posterior commissure during inspiration, with slight intermittent roaring, recalled bilateral paralysis of the dilators, which, as a rule, does not require immediate tracheotomy. This occurrence has demonstrated that the posterior edema, by blocking the arytenoids, presents serious consequences even when the dimension of the glottis is not particularly reduced.

During the discussion that followed the communication, Lubet-Barbon remarked that pallor and livid discoloration of the teguments are the main symptoms of nonacute edema of the larynx. He has seen crises of asphyxia suddenly complicating this apparently mild condition, and ending with death after two or three days of slight dyspnea. On the other hand, these patients may also succumb from syncope rather than from suffocation. He has witnessed deaths even after tracheotomy. In such cases, then, death is due to compression of the pneumogastric nerve or one of its branches.

Morbid Disturbances Due to the Handling of Celluloid

The number of occupational diseases is constantly increasing, and Dr. F. Heim, professor of industrial hygiene of the Conservatoire National des Arts et Métiers, has directed attention to an interesting observation. With the collaboration of Drs. E. Agasse-Lafont and A. Feil, he examined, from a clinical and hematologic standpoint, women employed in making small portable battery boxes of celluloid. Their ages ranged from 17 to 53, and they have been working with celluloid from one to five years. They employ two substances: the celluloid powder, containing camphor, is very inflammable, and its odor is disagreeable to any one entering the factory; the other is a sort of glue containing a mixture of equal parts of amyl acetate and acetone. Their inquiry on morbid manifestations attributed to celluloid intoxication revealed one transitory clinical sign, headache, and a persistent and frequent hematologic symptom, eosinophilia. This cause of toxic eosinophilia is important, and Agasse-Lafont and Heim had already reported it after an inquiry concerning the condition of workmen pasting and perforating films in a motion picture studio. It resembles somewhat benzene eosinophilia. Although it has not the pathognomonic value of granular degeneration of erythrocytes in chronic lead poisoning, this eosinophilia is interesting because it gives an almost indubitable proof of intoxication or, at least, of a reaction to saturation of the organism by fumes of acetone and of amyl acetate. On the other hand, the lack of knowledge of this cause of eosinophilia might entail errors in diagnosis, as when a workman handling celluloid is clinically suspected of intestinal parasites or hydatid cyst, as the diagnosis of these affections is often based on the finding of eosinophilia.

War Losses

Up to Sept. 1, 1921, the pension office had received 2,500,000 claims for pensions or allowances, of which 1,712,000 were granted, being thus distributed: 830,000 among the incapacitated; 447,000 among widows and orphans, and 413,000 among

parents. Firty-nine thousand of the incapacitated were totally invalided, and 60,000 suffered disability amounting to from 80 to 95 per cent. The 456,125 pensions granted up to April, 30, 1920, were thus distributed:

Percentage of Disability	Final Pensions	Temporary Pensions
10	2,059	56,665
20	3,064	92,390
30	1,120	78,088
40	455	50,013
50	346	38,675
60	14,915	24,465
65	41,553	.....
80	40,329	6,688
100	5,104	5,645

Following are the statistics of the war wounded: From 1914 to 1916, wounded and sick (front and rear lines): 1914, 776,274; 1915, 1,326,911; 1916, 677,891; sick: 1915, 1,117,930; 1916, 899,310. From 1916 to 1919, at the front: wounded, 1917, 269,853; 1918, 212,915; 1919, 23,622; sick: 1917, 360,911; 1918, 321,706; 1919, 87,244. Rear lines: wounded, 1917, 338,907; 1918, 610,987; 1919, 46,201; sick, 1917, 769,896; 1918, 940,452; 1919, 208,380. For Algeria and Tunis: wounded, 1914, 22,015 (including the sick); 1915, 8,055; 1916, 18,099; 1917, 13,696; 1918, 12,496; 1919, 2,821; sick, 1915, 15,683; 1916, 54,005; 1917, 44,835; 1918, 55,870; 1919, 12,946. Summing up these figures we have: wounded, 3,594,889; sick, 4,988,213. It may be interesting to compare these figures with those concerning men sent back from the front to the interior of the country: 1914, 490,000; 1915, 1,019,000; 1916, 551,000; 1917, 375,000; 1918, 675,000.

Medical Tours to Water and Health Resorts

Under the direction of Dr. Paul Carnot, professor of therapeutics in the Paris faculty of medicine, and of Dr. F. Rathery, associate professor, the sixteenth medical tour to the mineral water and health resorts of France will include the stations of the southwest and those west of the Pyrenees Mountains: Arcachon, Biarritz, Dax, Pau, Cauterets, Luchon, etc. It will take place from August 26 to September 6 of this year. Members will meet at Arcachon, August 27, and will disband at Luchon, September 6. French and foreign confrères can subscribe by sending a check of 680 francs to Dr. Maurice Gerst, general secretary, 94 Boulevard Flandrin, Paris (16). This fee includes all expenses.

BELGIUM

(From Our Regular Correspondent)

LIÉGE, June 7, 1922.

Regulation Concerning the Sale of Disinfectants

To repress fraud and abuses in the sale of proprietaries which rely entirely on advertising for their existence, the authorities have compiled regulations concerning the sale of disinfectants and antiseptics. The containers must now bear a label indicating (1) the name and address of the manufacturer or person selling the product; (2) its composition, indicated in usual terms regardless of the chemical formula; (3) the instructions for the various uses of the product, and (4) its bactericidal value, especially the concentration, temperature and the time required to kill bacilli. Pamphlets, or advertising matter pertaining to these products must be identical with the label and contain only additional information that may be useful to the purchaser. The retailing of disinfectants or antiseptics is limited to public drug stores. All products not registered in the pharmacopeia, but sold as disinfectants or antiseptics, are subject to these regulations.

Testing the Mentality of Schoolchildren

Dr. Rémy, chief inspector of hygiene of the ministry of the interior, recently, in the schools of Etterbeek, made practical experiments before the members of the Belgian society of pediatrics by means of apparatus and procedures invented by him to test the fatigue and mental capacity of schoolchildren. He had previously given to the society the results obtained during a course of research extending over more than seven years, and had shown how he can classify schoolchildren according to their mentality in a practical and rather accurate manner. The apparatus and procedures conceived by him allow teachers to examine simultaneously all children in one grade and to establish the average of visual, auditive and tactile memories. The age of children and results of their yearly school examinations furnish other averages. Gifted children are above these averages, and the others are below. Account was also taken, at the same time, of conditions that may influence the performance of pupils, on which depend not only advice as to choice of profession or life work and the assignment of scholarship funds to those who are better endowed, but also, in the last analysis, the hoped for increase in productive capacity and the consequent uplift that will accrue to their country.

Ovarian Grafts

Dr. de Bruyn reported to the society of gynecology and obstetrics certain experimental facts as to ovarian grafts, citing one clinical case in which fragments of ovaries were transplanted in the subcutaneous tissue of a woman of 25 after subtotal hysterectomy with bilateral ovariectomy. The grafts hypertrophied, and ablation was performed 178 days after the operation, whereupon the menopause occurred. Statistics from the Ghent clinic show that, in cases of hypertrophy of grafted tissue, postoperative menopause disturbances are less frequent when there is no transplantation or when the graft is not larger than a pea. On the other hand, a grafted fragment of the corpus luteum hypertrophies only in 20 per cent. of the cases, a fragment of the medulla in 33 per cent., and a portion of the cortical layer in 70 per cent. The cortical layer seems to prevent disturbances of ovarian insufficiency more than any other tissues of the ovary. Ovaries in which a grafted fragment had hypertrophied had a normal histologic aspect; those in which there was no graft, or a graft smaller than a pea, were composed mostly of sclerous tissues; while in one, a woman of 40, the ovaries presented the histologic picture of a normal organ. After 40, grafts never seem to hypertrophy.

Death of Ernest Solvay

Although Ernest Solvay was not a member of the medical profession, his life was too closely associated with it to let his death pass unnoticed. He was an honorary doctor of the University of Brussels, and an eminent sociologist, and his generosity was proverbial. His improved method for the manufacture of soda was a great economic achievement; and he devoted a great part of his wealth to the foundation of scientific and social institutions. He created the Institute of Physiology, the Institute of Sociology and the School of Commerce in the University of Brussels, and he founded also the International Institute of Chemistry and the International Institute of Sociology.

Exchange of Lecturers Between France and Belgium

The end of the academic year 1921-1922 was marked by the beginning of a new undertaking, created after the armistice, which is the consecration of the friendly ties uniting France and Belgium in every form of their activity. The faculties of Brussels and Liége recently heard a series of lectures by French professors. Gley spoke on endocrine glands; J. L. Faure gave motion picture lectures on his method of hysterectomy; Picqué demonstrated the usefulness of anatomy as applied to surgery, by a series of twelve demonstrations, and Balthazard presented the problem of intoxication by carbon monoxid gas. This first series of foreign lectures was much appreciated by students, and also by physicians, who attended in large numbers.

Marriages

BEAUFORD IVAN PIPPIN, Excelsior, Wis., to Miss Beba Nevada Hudson of Richland Center, Wis., April 6.

LESTER EMMET TRETHEWAY, Manteca, Calif., to Miss Charlotte L. Amarantes of Pleasanton, Calif., June 18.

KARL BUSBEE PACE, Greenville, N. C., to Miss Lida Harrison Taylor of Goldsboro, N. C., June 7.

EDGAR JOSEPH CRAITE, Rich Lake, Wis., to Miss Margaret Sheedy of Green Bay, Wis., May 18.

WALTER H. SPOENEMANN, Chicago, to Miss Carol Stucke of Michigan City, Ind., June 17.

PAUL PLEASANT COOPER, Zirkle, Ga., to Miss Sallie Williams of Patterson, Ga., June 3.

VICTOR HUGO GARDNER, Dunnel, Minn., to Miss Florence Jack of Tomah, Wis., June 27.

EMERY DON LUKENBILL, Portland, Ind., to Miss Treva Steed of Redkey, Ind., May 8.

WESLEY RAYMOND WELLS to Miss Flora S. Monroe, both of Lake Forest, Ill., recently.

HARRY EUGENE WILSON, Baltimore, to Miss Angelo Pauline Kehoe at Baltimore, June 24.

LEE SANFORD SEWARD to Miss Eunice Smith, both of Ahwahnee, Calif., June 15.

HUBERT ROGERS ARNOLD to Miss Agnes Ward, both of Oakland, Calif., recently.

MAURICE E. SHAMER to Dr. Bertha E. Tapman, both of Baltimore, June 18.

B. H. ABEREMBT, Milwaukee, to Miss Rosalia Sullivan, Wausau, May 18.

EDWARD DUDLEY ALLEN to Miss Grace V. Robeson, both of Chicago, June 14.

RICHARD KOVACS to Miss Ina Clare Nickel, both of New York, June 14.

Deaths

Herman Tuholske ⊕ St. Louis; Missouri Medical College, St. Louis, 1870; formerly demonstrator of anatomy and professor of surgery at his alma mater, and professor of surgery at the Washington University Medical School; at one time physician-in-chief at the St. Louis City Dispensary, surgeon-in-chief at the Jewish Hospital, consulting surgeon at St. John's Hospital, Jewish Home for Chronic Invalids and others; president of the St. Louis Medical Society in 1908; died, June 12, aged 74, from chronic interstitial nephritis and hypostatic pneumonia.

Winton Markwood Nihiser ⊕ Hagerstown, Md.; College of Physicians and Surgeons, Baltimore, 1882; Bellevue Hospital Medical College, New York, 1885; formerly president of the Washington County Medical Society; served as surgeon for the Baltimore and Ohio Railroad for a number of years; was found dead in his office, June 17, with a bullet wound in his head, presumably self-inflicted, while suffering from ill health, aged 63.

Edward Aaron Aronson ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1899; at one time instructor in the Fordham University Medical College and the College of Physicians and Surgeons, New York; formerly instructor in internal medicine at the New York Polyclinic Medical School; on the staff of the Mount Sinai Hospital, where he died while undergoing an operation, June 24, aged 47.

John Cropper Wise ⊕ Medical Director, U. S. Navy, Washington, D. C., Washington University School of Medicine, Baltimore, Md., 1869; entered the Navy as assistant surgeon, April 28, 1870, and retired Oct. 7, 1910; was fleet surgeon on the *Baltimore* of the Asiatic Fleet from 1897-1899, taking part in the battle of Manila Bay; formerly in command of the U. S. Naval Hospital, Washington; died, June 13, aged 73.

Edison Burr Starr ⊕ Columbus, Ohio; Jefferson Medical College, Philadelphia, 1905; formerly director of industrial hygiene and medicine in the U. S. Public Health Service; at one time health director of Springfield; chief of the state division of industrial hygiene; died, June 19, aged 41, from typhoid fever.

Reuben Lindsay Robertson, Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, Va., 1882; following his graduation he served in the U. S. Army for a period of twenty years; formerly city health officer; died, June 4, aged 62, at University Hospital, from septic pleurisy.

George Howard Wilson ⊕ Mount Carmel, Ill.; University of Louisville Medical Department, Louisville, 1912; served during the World War in the M. C., U. S. Army, with the rank of captain; specialized in radiography; coroner of Wabash County; died, June 19, aged 30, from carcinoma of kidney.

Allen J. Perkins, Lake Charles, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1888; member of the Louisiana State Medical Association; coroner of Calcasieu Parish; died, June 20, from a bullet wound through the head, presumably self-inflicted, aged 56.

Joseph Albert Hague ⊕ Alton, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, Ga., 1913; formerly member of the state board of medical examiners; aged 38; shot and killed himself, June 12, in one of the rooms of his hospital.

Martin V. B. Newcomer, Tipton, Ind.; Medical College of Ohio, Cincinnati, 1867; member of the Indiana State Medical Association, and the American Association of Railway Surgeons; died at the home of his daughter in Delphi, June 13, aged 85.

Rosalie Bell ⊕ New York; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1898; for six years an inspector of the department of health; died, June 14, at West Brighton, N. Y., from heart disease.

William Leo Mulcahy ⊕ Far Rockaway, N. Y.; Albany Medical College, Albany, N. Y., 1903; on the staff of the St. Joseph's Hospital; died, June 16, at the St. Mary's Hospital, San Francisco, from cerebral hemorrhage, aged 40.

Benjamin Franklin Abernathy, Danville, Tenn.; College of Physicians and Surgeons of the Western District of New York, Fairfield, N. Y., 1890; died recently, aged 72, from influenza and pneumonia.

Harry Charles Gabriel, Athens, Ohio; Starling Medical College, Columbus, Ohio, 1894; member of the Ohio State Medical Association; died, June 2, at Beckley, W. Va., aged 55, from heart disease.

George Albert Libbey, Tacoma, Wash.; Dartmouth Medical School, Hanover, N. H., 1875; member of the Washington State Medical Association; died, June 18, aged 71, from cerebral hemorrhage.

James O. Bates, Grand Haven, Mich.; Hahnemann Medical College and Hospital of Chicago, 1884; member of the Michigan State Medical Society; was found dead in his office, June 17, aged 73.

William M. Richards, Joliet, Ill.; Chicago Medical College, Chicago, 1876; died, June 17, aged 68, at the St. Luke's Hospital, Chicago, from injuries received when he was struck by a street car.

Cecil Stevens Cutler, Northampton, Mass.; Medical Department of the University of the City of New York, 1877; formerly member of the city council; died, June 8, aged 71, from heart disease.

Marshall E. Cooksey, Etoile, Ky.; Hospital College of Medicine, Medical Department Central University of Kentucky, Louisville, Ky., 1880; died, June 9, aged 82, from tuberculosis.

Guy S. Dunbar, Cleveland; University of Louisville Medical Department, Louisville, Ky., 1915; member of the Ohio State Medical Association; died recently, aged 33, from pneumonia.

Mark A. Brawley ⊕ Frankfort, Kan.; Cincinnati College of Medicine and Surgery, Cincinnati, 1873; formerly city health officer; veteran of the Civil War; died, June 16, aged 72.

Charles Williamson Crumb ⊕ Utica, N. Y.; Medical Department of the University of the City of New York, 1886; died, June 18, aged 56, at his summer home in New Hartford.

Arthur Otis McLaughlin ⊕ Haverhill, Mass.; Tufts College Medical School, Boston, 1912; died, June 18, aged 42, at the Hale Hospital, from heart disease.

⊕ Indicates "Fellow" of the American Medical Association.

Edward F. Bruce, Pensacola, Fla.; Medical Department of the Tulane University of Louisiana, New Orleans, 1897; was found dead in his office, June 19, aged 45.

George Louis Schmitt, Kansas City, Mo.; University Medical College of Kansas City, Mo., 1898; aged 46; was shot and killed in his office recently by a patient.

Albert H. Felch, Beatrice, Neb.; Hahnemann Medical College of Philadelphia, 1876; member of the Nebraska State Medical Association; died, June 3, aged 72, from paresis.

William Bostick ✠ St. Louis; Kansas City Medical College, Kansas City, Mo., 1898; died, June 17, aged 45, at the Evangelical Deaconess Home and Hospital.

James W. Jenney, Salina, Kan.; Western Homeopathic College, Cleveland, 1868; member of the Kansas Medical Society; died, June 14, aged 75, from pneumonia.

William C. McCurdy, Philadelphia; College of Physicians and Surgeons, Baltimore, 1874; died, May 20, aged 66, at the Philadelphia General Hospital.

George Howe Winkler, New York; University of Georgia Medical Department, Augusta, Ga., 1881; died, May 23, aged 74, from cerebral hemorrhage.

George W. Meredith, Lincoln, Neb.; Indiana Medical College, Indianapolis, 1873; formerly member of the state legislature; died, June 15, aged 70.

William F. Bullard, Berrien Springs, Mich.; Medical College of Indiana, Indianapolis, 1880; died, May 18, aged 73, following a long illness.

George Heslop Grey, Rochester, N. Y.; Niagara University Medical Department, Buffalo, 1893; died, June 1, aged 50, from diabetes mellitus.

Frederick James Barrett ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1905; died recently, aged 52.

Kennett L. Jones, Lewisburg, Tenn.; Vanderbilt University Medical Department, Nashville, 1890; was struck and killed by lightning, June 12.

Dennis Alphonsus Murphy ✠ Gloversville, N. Y.; Albany Medical College, Albany, N. Y., 1904; died, June 14, aged 41, from pleuropneumonia.

George W. Vernon, Dexter, Mo.; Central College of Physicians and Surgeons, Indianapolis, 1886; died, June 5, aged 64, from heart disease.

Caswell A. Atkins, Power Springs, Tenn.; Medical Department University of Tennessee, Memphis, Tenn., 1899; died, June 13, aged 68.

William Harper, Byron, Mich.; Rush Medical College, Chicago, 1866; formerly a member of the state legislature; died, June 4, aged 79.

L. S. Young, Moreland, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, Ga., 1880; died, June 9, aged 83, from senility.

Clarence S. Latham ✠ Hamilton, Ohio; Starling Medical College, Columbus, Ohio, 1905; died, June 2, aged 40, from heart disease.

Wickes Washburn, Elizabeth, N. J.; Medical Department of the University of the City of New York, 1877; died, June 19, aged 68.

Joseph Grant Wheeler, Jr. ✠ Bellevue, Pa.; University of Pittsburgh School of Medicine, Pittsburgh, 1920; died, June 7, aged 26.

John Emmet O'Brien ✠ Scranton, Pa.; Rush Medical College, Chicago, 1869; Civil War veteran; died, June 14, aged 73.

Allen M. Riggs, Lafollette, Tenn.; University of Tennessee College of Medicine, Memphis, Tenn., 1893; died, April 5, aged 55.

Samuel T. Floyd, Kansas City, Mo.; Missouri Medical College, St. Louis, 1870; Confederate veteran; died, June 1, aged 81.

Joseph Clark Lackey ✠ Jamestown, Ohio; Ohio Medical University, Columbus, Ohio, 1896; died, May 16, aged 53.

William S. Taylor, Marrowbone, Ky.; Kentucky School of Medicine, Louisville, Ky., 1889; died, May 26, aged 63.

Josiah S. Wailes, Mystic, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1889; died, April 16, aged 73.

Clarence Augustus Stetson, Lynn, Mass.; Medical School of Maine, Portland, 1892; died, June 17, aged 61.

Maria Allen Jessup, Farfield, Ind.; Woman's Medical College, Chicago, 1887; died, May 5, aged 76.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

THE HILLSIDE COMPANY OF S. W. STAADS

Your Liberty Bonds or Cash Will Be Accepted to Exploit a German Cancer Cure—Twenty Per Cent. Profits Assured

A Nebraska physician writes:

"I am enclosing a letter from the Hillside Company which was sent to me by a clergyman friend of mine, whose letter I also enclose. These letters are self-explanatory and you have his permission to make use of them if you care to do so."

The letter from the doctor's ministerial friend reads in part:

"I enclose a letter for your inspection. I don't know where that institution got my name, but I believe they want to soak a poor preacher."

The enclosure itself is a mimeographed letter on the stationery of the Hillside Company, Sioux City, Iowa, and is signed "Dr. S. W. Staads." It is written in German and the first paragraph reads:

Dear Friend:—It will be of interest to you, as it will be to every friend of suffering humanity, to know that German physicians have succeeded in their investigations to the extent that they have been able to prepare remedies that have cured the most difficult cases of cancer, without operation. In fact, also patients who had been operated on in vain or who had received roentgen-ray or radium treatment without success have been completely cured. Through reading German medical literature and the kindness of my medical friends in Germany, I became familiar with these remedies a number of years ago, and I have now been positively assured that the rights to these remedies for the whole United States will be turned over to us under certain conditions. Enormous prospects are thus opened up to us. On the one hand, this means a great boon for the cancer patients in our country, and, on the other hand, such a concession for the whole United States means untold profits for us. All physicians would gladly seize the opportunity if they knew of a cancer remedy that had been authoritatively approved."

The letter then states that it is the purpose of the Hillside Company to send a representative to Germany "to draw up the necessary contracts" which will doubtless result in the shares of the company rising considerably. In the meantime, this wonderful opportunity is given the "friends and acquaintances" of Staads to get in on the ground floor: shares in the Hillside Company at $10 per share! Furthermore, Staads declares himself ready at the request of the purchaser to buy back these shares within two years of the date of issuance at the price paid for them and, in addition, assures the purchaser a profit of 20 per cent. *"Ich erkläre mich bereit auf Wunsch diese Shares zwei Jahre nach Ausstellungsdatum, zum selben Preise zurück zu keufen und dass dieselben dann 20% eingebracht haben sollen."*

Any one who wishes to accept this "absolutely safe offer" (*"absolut sichere Anerbieten"*) must fill out the enclosed subscription blank and send it, with cheque, no later than May 25. "War Savings Stamps and Liberty Bonds will be accepted in payment at price we receive for them."

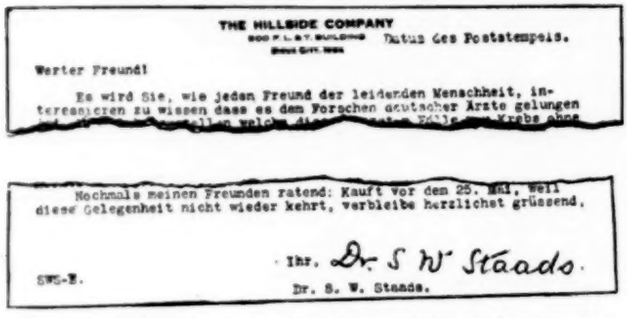
The Hillside Company is, apparently, a family affair, with S. W. Staads, president, his son-in-law, vice president, and his son (a chiropractor, it is said) secretary and treasurer. The company is reported to be a "trust estate" with an authorized common stock of $200,000 and an authorized preferred stock of $150,000. How much capital has been paid in has not been learned.

SOME EDUCATIONAL DATA

S. W. Staads' name appears in each issue of Polk's Medical Directories from 1900 until 1917, inclusive. In each case it is a display announcement giving the alleged educational and professional qualifications. In the directories for 1900, 1902 and 1904 Staads is given as a graduate of the "German Medical College of Chicago, Ill., 1892" and of the "Independent Medical College, Chicago, 1899." The "German Medical Col-

lege," long since out of existence, was during its brief span repeatedly characterized by the Illinois State Board of Health as a fraudulent diploma mill. It was operated by one Johann Malok who, according to the Illinois State Board of Health, "profited by the wide-open incorporation laws of Illinois to the extent of securing charters for a brood of fraudulent diploma-selling institutions." The "German Medical College" was not chartered until Dec. 28, 1891; Staads was "graduated" in 1892!

The "Independent Medical College" was a fraudulent Chicago diploma mill whose charter was revoked by the Supreme Court of Illinois in 1899—the year of Staads' "graduation." The directory for 1906 and all subsequent issues contain no reference to Staads' "graduation" from the "Inde-



THE HILLSIDE COMPANY

Werter Freund!

Es wird Sie, wie jeden Freund der leidenden Menschheit, interessieren zu wissen dass es dem Forscher deutscher Ärzte gelungen

Nochmals meinen Freunden ratend: Kauft vor dem 25. Mai, weil diese Gelegenheit nicht wieder kehrt, verbleibe herzlichst grüssend,

Ihr, Dr. S W Staads.

SWS-E. Dr. S. W. Staads.

Photographic facsimile (reduced) of the opening and closing sentences of the letter of S. W. Staads in the latest attempt to sell stock.

pendent Medical College"; Staads still claims graduation from the "German Medical College."

In the same notices in Polk's directories we find Staads is also a "D. P. Chicago School of Psychology, 1897," and a "B. S. Chicago Seminary of Science, 1899!" In addition, he claims a "special course Chicago Homeopathic Medical College, 1897," and "Pratt's Course of Orificial Surgery" over a period of years commencing with 1898 and adding to these years with each subsequent edition of the directory. Of Staads' membership in medical organizations the directories showed:

Member American Institute of Homeopathy.
Missouri Valley Homeopathic Medical Association.
Hahnemann Medical Association of Iowa.
Sioux City Homeopathic Medical Society.
American Association of Orificial Surgeons.
Hon. Member Nebraska State Homeopathic Medical Society.

The directories also gave Staads as "Staff Surgeon, German Lutheran Hospital, Sioux City, and Lecturer to the German Hospital Training School, Sioux City, Iowa."

In the spring of 1911, following a discussion in THE JOURNAL regarding the "fee splitting" evil, a physician sent in a letter that he had received from Staads. The opening sentence of the letter called attention to the alleged fact that Staads limited his "work to surgery and gynecology exclusively" and that he would "be pleased to take care of any surgical cases" that might be sent him. Later in the letter Staads said:

"Should a physician be paid for taking an operative case to a surgeon, and for his assistance in such cases, and for the responsibility and work he shares? He certainly is entitled to such recompense."

Whether this was a cryptic reference to the secret division of fees, we do not know; the physician who received the letter evidently thought that it was.

THE SANITARIUM COMPANY

The Hillside Company is not the first stock-selling scheme of Staads' that THE JOURNAL has felt impelled to bring to the attention of its readers. In this department for March 15, 1913, under the title "Another Get-Rich-Quick Scheme," the "Sanitarium Company" of Sioux City, Iowa, was dealt with. The Sanitarium Company had for its president S. W. Staads. Its alleged object was "to manufacture and sell medicines for humankind and animals, chemicals, pharmaceuticals, infant and invalid foods, health coffees, to build and maintain a Sanitarium, etc."—a fair sized order. German-Americans, preachers and physicians, were circularized, and a return of "22½ per cent. on your money" and, in some instances, 35 per cent. was promised to those who would invest.

The prospectus declared that the Sanitarium Company had closed a contract with a German drug concern which would give it the exclusive right "to manufacture all of their products as medicines, chemicals, foods, etc., which have a tremendous sale in Europe." Nor was this exclusive concession limited to the United States: it took in also Canada, Cuba, the West Indies, Mexico, Philippine Islands, and practically all South America. As the prospectus naively said:

"You will admit that with such large territory and such excellent preparations which have a great reputation where known, we have a wonderful future full of the very best opportunities. When thoroughly established in the United States through wide advertising to the physicians, druggists and the laity, we will gradually have to open branches in Canada, Mexico, Cuba, South America, the Philippines, etc. Have you any conception of the wonderful possibilities of such work? Just think what it means to have thousands of physicians and druggists as shareholders as we intend to get! All shareholders are entitled to 10 per cent. discount for cash on any direct purchase of our goods not marked net, and on bills incurred at the proposed Sanitarium. A 10 per cent. discount means a good deal to the dispensing physicians and druggists, and rest assured, they will gladly buy from us all they can and recommend our preparations. Does not that stand to reason? And that alone spells success."

In addition, it was claimed that a large house had been bought in neighboring city (Cedar Rapids); this was going to be remodeled and turned into a "Hospital-Sanitarium." This institution, said the prospectus, would have an advantage over all others in the United States in that it would be the only one in which patients would be able to get the medicinal preparations made by the German concern whose exclusive rights the Sanitarium Company had obtained! As a subsidiary of the Sanitarium Company was the Physio-Chemical Company, which put out a line of "patent medicines." These facts and others were given in detail in THE JOURNAL'S article which, in closing, expressed wonder as to "how many physicians or 'Dear Reverends' would really invest good money in such a crudely and baldy exploited scheme."

The present scheme is just as crude and bald. In order to get preachers and others to send in their Liberty Bonds

35% im ersten Jahre sicher!

The Sanitarium Company

SIOUX CITY, IOWA

Direktoren:

Werter Herr Pastor!

Sie sind vielleicht einer der wenigen Menschen, die es nicht nötig haben, kleine Ersparnisse fürs Alter oder für die Hinterlassenen sicher und gewinnbringend anzulegen. Wenn das der Fall ist, dann hat

Reproduction (reduced) of the opening sentence of the letter sent out in 1913 to preachers.

or their money Staads would have them believe that he can get the exclusive right to some made-in-Germany nostrums that will cure "the most difficult cases of cancer."

Hookworm Disease in Brazil.—A recent report by Dr. Belizario Penna shows that, from July, 1918, to September, 1921, about 300,000 persons were examined in the hookworm dispensaries. In the federal district and neighboring territory, 236,890 persons were examined, 213,050 of whom were found infected with intestinal parasites. More than 34,000 cases of malaria were treated. A total of 616,451 hookworm treatments were given. There were 34,682 persons vaccinated or revaccinated. In some districts, the percentage of hookworm carriers varied from 31.9 per cent. to more than 99 per cent. Hookworm disease is an old disease in Brazil, where Wucherer and Silva Lima studied it, in 1860, under the name of intertropical hypohemia and tun-tun. The hookworm work has lately been conducted under the direction of Dr. Lewis Wendell Hackett of the Rockefeller Foundation. In 1921, the federal and state appropriations reached $2,300,000, in addition to the annual expenditure of $250,000 by the International Health Board.

Correspondence

PROPHYLAXIS OF VENEREAL DISEASE

To the Editor:—I have read with interest the communication on this subject by Dr. Herman Goodman, THE JOURNAL, June 24. He says, among other things, "The more prophylactics administered, that is, the more admitted exposures, the greater the incidence of venereal disease. On the other hand, when opportunity for prophylaxis was reduced by curtailment of opportunity of exposures, the incidence of venereal disease became practically nil." This statement is followed by two imposing tables of statistics. One can scarcely but suspect that the author has a subconscious bias against prophylaxis, perhaps for the same reason that the late Secretary of the Navy disapproved of it—that it licensed license. The sense of the letter would appear to be that if men are prevented from indulging in intercourse they are not likely to contract venereal disease, a conclusion with which all must agree. If one needed statistics to back this up the medical authorities of Sing Sing prison could furnish them.

The reason that I call your attention to this matter is that I had not supposed that the American Medical Association was interested in the reduction of disease rate by the exercise of police power on the individual. Conceding the fact that abstinence from sexual intercourse is a sure preventive of venereal disease, it appears to me that the enforcement of that abstinence lies in the province of individual morality rather than in that of preventive medicine.

ARMITAGE WHITMAN, M.D., New York.

"THE WILL TO BELIEVE"

To the Editor:—I have received a number of letters approving the position I have taken with regard to the performances of Willetta Huggins, and others expressing, somewhat after the manner of the communications of Dr. Babcock and of Dr. Nagel in THE JOURNAL, June 24 and 31, some reservations and a good deal of skepticism that sight sufficient to recognize colors should be possible despite a blindfold. With some acquaintance with the blindfold performances on the stage, I can say that the "goggles" type of blindfold used in Chicago would be regarded as one of the "easiest"—that is, easiest to circumvent. Sealing the eyelids with *opaque* court plaster, as suggested by Dr. Babcock, would be completely effective, as would also be a number of other devices known to those who have given attention to the subject; and the tests in a completely dark room would also be made decisive. Dr. Babcock is entirely correct in citing examples of the unusual and expert use of senses by the blind and deaf; and I know of a number of instances more remarkable than those he cites. But these cases do not function after the manner shown by Miss Huggins. The question of excluding hearing is by no means so simple. The experience of submarine detectors during the war seemed to show that nothing less than a device similar to a diver's helmet would answer. Only an expert would be competent to determine just how far sound was excluded; though it is open to any one with normal hearing to apply a sound-excluding device and determine just how much he can hear and understand with it or despite it.

There is no occasion to add anything in reply to Mr. Hooper's public comment on the conclusions which I presented (New York *World*, June 17), and presented not as final but as a caution against the gratuitous hypothesis that the performance demands the assumption of "smelling" colors or "understanding" vibrations through the fingers; though it may be pertinent to indicate the apologetics which are needed to defend this strange conclusion. To account for the failure, it is urged that the dark room at Madison was full of chemical odors which prevented the "smelling" of colors. It did not prevent the "smelling" (?) of colors when a low light was on in the same smelly room, but only when that light was extinguished.

Like Dr. Babcock, I am interested in having the matter determined beyond any doubt. For this end I have prepared a set of tests which I should be glad to have any competent person apply in a wholly objective manner and unembarrassed by the presence of any advocate who believes that the performance requires a resort to extraordinary assumptions, or by the presence of a skeptic like myself who—as in the case of mediums, who also claim unusual senses—is regarded as emanating unfavorable vibrations interfering with the exercise of the sense in question. As I indicated in my article in THE JOURNAL, June 17, the psychologic laboratory has adequate methods and technic to bring the matter to a definite conclusion. All that is needed is the cooperation of the subject and the determination of the conditions of the test by competent experimentalists. I trust that this will be done in the near future. Let it be understood that all depends on the technic and rigidity of the tests.

JOSEPH JASTROW, Madison, Wis.

METHOD FOR UTILIZING ETHYL CHLORID IN LOCAL ANALGESIA

To the Editor:—I wish to call attention to a simple but effective method of applying the ethyl chlorid spray for local analgesia. I have used this method for the last four years in opening localized infections and in the fulguration of warty growths. The reason that the freezing method as universally used is not effective is that the tissues are so hard that pressure enough to cause pain must be applied before the sharpest knife will cut through the frozen tissues. The method I suggest is to apply the spray so as to form a circle around the area to be incised or fulgurated, care being taken to keep the spray away from the center. The width of the frozen area should be at least half an inch, and there should be at least 1 inch of unfrozen area in the center of the circle. Blowing the breath on the freezing surface will be found to accentuate the freezing. As soon as a white crust forms *all the way around*, the incision should be made or the spark applied, immediately. There will be very little if any pain, as this is essentially a nerve-blocking anesthesia.

RAYMOND L. BRADLEY, M.D., Houston, Texas.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF CHEILITIS

To the Editor:—I have a patient who suffers from peeling every summer, owing, I think, to the effects of the sun, as he is in the open all day. The part of the lip affected is the mucous surface just posterior to the mucocutaneous junction. I have tried everything I could think of without much benefit. This trouble persists until cool weather, and then subsides until the next summer. Anything you might be able to suggest in the line of treatment would be appreciated. The patient cannot protect himself from the sun. He has to work in the open. Please do not publish my name. PHYSICIAN.

ANSWER.—There are patients who have inflammatory reaction in the lips, cheilitis, from exposure to the sunlight. It is difficult or impossible to overcome if exposure of the lips cannot be avoided, as is usually the case. The use on the lips of a thick paste, made skin color with zinc oxid and calamine (or "crocus martis") as coloring, would offer pro-

tection against the sun's rays, and if used persistently and frequently might be a great benefit. When the patient is, as this one, a man, he might raise a walrus mustache, provided his mustache is heavy, which would give great protection from sunlight.

PYROGALLIC ACID AS HAIR DYE

To the Editor:—Is pyrogallic acid in a 2 per cent. solution a safe hair dye for brown hair that is prematurely gray? A young woman in my practice comes to me with this question, and I am unable to answer her. If the pyrogallic acid is no good, kindly suggest something better. Please omit my name. SUBSCRIBER.

ANSWER.—Pyrogallic acid is not an entirely safe application as a hair dye. It sometimes causes dermatitis, and poisoning has been observed from it. It is usually used in combination with silver nitrate. Probably as good a dye as any is paraphenylendiamin, which is the usual dye used for dyeing hair and furs brown or black. This also, in susceptible persons, causes dermatitis, but not frequently. There is no hair dye that is free from all risk.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, July 11. Chairman, Dr. Samuel W. Welch, Montgomery.

CONNECTICUT: Hartford, July 11-12. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford.

CONNECTICUT: New Haven, July 11. Sec., Eclec. Bd., Dr. James Edwin Hair, 730 State St., Bridgeport. Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, July 11. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.

HAWAII: Honolulu, July 10. Sec., Dr. G. C. Milnor, 401 Beretania St., Honolulu.

INDIANA: Indianapolis, July 11-13. Sec., Dr. W. T. Gott, State House, Indianapolis.

MASSACHUSETTS: Boston, July 11-13. Sec., Dr. Samuel H. Calderwood, 144 State House, Boston.

NEW MEXICO: Santa Fe, July 10-11. Sec., Dr. R. E. McBride, Las Cruces.

OKLAHOMA: Oklahoma City, July 11-12. Sec., Dr. J. M. Byrum, Shawnee.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 11. Sec., Mr. Thomas E. Finnegan, State Capitol, Harrisburg.

SOUTH DAKOTA: Waubay, July 18. Director, Dr. H. R. Kenaston, Bonesteel.

WASHINGTON: Olympia, July 11. Sec., Mr. William Melville, Olympia.

WEST VIRGINIA: Martinsburg, July 11. State Health Commissioner, Dr. W. T. Henshaw, Charleston.

Wisconsin January Examination

Dr. John M. Dodd, secretary, Wisconsin State Board of Medical Examiners, reports the oral, written and practical examination held at Madison, Jan. 10-12, 1922. The examination covered 19 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 17 candidates examined, 14, including 1 osteopath, passed, and 3, including 1 osteopath, failed. Twelve candidates were licensed by reciprocity, and 1 candidate received an osteopathic license by reciprocity. Six candidates were licensed on government credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery		(1912)	80
Northwestern University		(1922)	86
Rush Medical College		(1906) 85, (1921)	91
Harvard University		(1921) 87,	89
Tufts College Medical School		(1920)	86
Washington University		(1921) 80, 85,	88
Columbia University		(1920)	91
Marquette University		(1905)	78
University of Vienna		(1903)*	81
Osteopath			85
	FAILED		
Loyola University		(1917)†	81
Marquette University		(1922)†	86
Osteopath			58

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Denver and Gross College of Medicine		(1909)	New York
Loyola University		(1921)	Illinois
Northwestern University		(1921, 2)	Illinois
Rush Medical College		(1916) Minnesota, (1919), (1921, 4)	Illinois
Keokuk Medical College, Coll. of Phys. and Surgs.		(1902)	Illinois
University of Louisville Medical Dept.		(1910)	Kentucky
Osteopath			Missouri

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
College of Physicians and Surgeons, Chicago		(1903)	U. S. Army
Northwestern University		(1908)	U. S. Army
Rush Medical College		(1905)	U. S. Army
Fordham University		(1916)	U. S. Army
University of Texas		(1913)	U. S. Army
Medical College of Virginia		(1886)	U. S. Army

* Graduation not verified.
† Fell below 60 per cent. in one branch.

Alaska March Examination

Dr. Harry C. DeVighne, secretary, Alaska Territorial Medical Examining Board, reports the written examination held at Juneau, March 7, 1922. The examination covered 9 subjects and included 100 questions. An average of 75 per cent. was required to pass. Two candidates were examined, both of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Louisville		(1907)	86
University of Toronto		(1918)	90

Ohio Reciprocity Meeting

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports that 19 candidates were licensed by reciprocity at the meeting held April 4, 1922. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado		(1914)	Colorado
Illinois Medical College		(1905)	Alabama
Rush Medical College		(1884) Kansas, (1917)	New York
University of Louisville Medical Department		(1917)	Kentucky
Johns Hopkins University		(1907), (1912)	Maryland
University of Michigan Homeopathic Medical College		(1921)	Michigan
Washington University		(1911)	Missouri
Syracuse University		(1917)	New York
Eclectic Medical College		(1915)	Nebraska
University of Cincinnati		(1916)	Kentucky
Jefferson Medical College		(1895)	Penna.
University of Pennsylvania		(1917) New York,	Pennsylvania
Mcharry Medical College		(1913) Alabama, (1918)	Arkansas
University of the South Medical Department		(1908)	Washington
Laval University		(1891)	Michigan

Porto Rico April Examination

Dr. M. Quevedo Baez, secretary, Porto Rico Board of Examiners, reports the written and practical examination, held at San Juan, April 4, 1922. The examination covered 9 subjects and included 75 questions. An average of 75 per cent. was required to pass. Two candidates were examined, both of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
State University of Iowa College of Homeopathic Med.		(1919)	77.1
University of Maryland		(1920)	87.5

Nevada May Examination

Dr. Simeon L. Lee, secretary, Nevada State Board of Medical Examiners, reports the written examination held at Carson City, May 1, 1922. The examination covered 13 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 6 candidates examined, 5 passed and 1 failed. One candidate was licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Physicians and Surgeons, San Francisco		(1918)	83.3
Oakland College of Medicine and Surgery		(1920)	82.7
Kansas City University of Physicians and Surgeons		(1922)	75
Cornell University		(1920)	95.4
Ohio State University College of Medicine		(1920)	84.4
	FAILED		
Chiba Special Medical School		(1905)*	69.3

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Saginaw Valley Medical College		(1903)	Michigan

* Graduation not verified.

Miscellany

A GERMAN VISITOR'S IMPRESSIONS OF AMERICAN MEDICINE

Dr. Hans Holfelder (*Klinische Wochenschrift* **1**:531 [March 11] 1922) gives an account of his visit to the United States a few months ago. During his first short stay in Buffalo he was soon convinced of the efficacy of buried radium emanation in the treatment of malignant tumors, particularly cancer of the tongue and primary carcinoma of the rectum, whereas in metastases and recurrences it could not be used. Just the opposite is true of the German method of roentgenotherapy. He considers radium emanation as adapted only to primary tumors of the mucosa.

In giving his impressions of American hospitals, Holfelder brings out the fact that they usually do not have *Chefärzte* (chief or head physicians) as in Germany, but are open-staff hospitals in which a considerable group of physicians and surgeons work side by side. He thinks that with America's vast wealth it would be destined soon to assume an unquestioned position at the head of the medical science of the world if it were not for the peculiar organization of the hospitals, which not only militates against a uniform and systematic instruction of interns and assistant physicians and surgeons but also makes genuine research work more difficult. The trouble seems to be that in the open-staff hospitals the interns are the assistants of from ten to twenty different physicians, who belong to the staff of the hospital, and that, for this reason, they do not come under the influence of any particular school. In some large cities, such as New York, the staff undergoes frequent changes throughout the year, which deprives the interns of the opportunity of continuous and systematic instruction. The intern is responsible for the care of certain wards in which a large number of physicians treat their patients in a promiscuous manner. Today the intern comes in contact with one physician and tomorrow with another, so that there is not the necessary continuity in the instruction he receives. Another thing that makes this condition worse is the "unevenness" which is characteristic of American universities and medical schools, owing to the fact that they are not under state control. However, the classification of medical colleges as A, B and C schools has done a great deal toward remedying the unevenness of medical instruction, and will doubtless accomplish still more in the future. Whereas the absolutely free competition that has prevailed in the past has been conducive to a high ethical tone, he sees in the operation of the Volstead act a grave menace to the morale of American physicians.

He thinks the Ford Hospital at Detroit the most luxuriously appointed hospital he has ever seen; and as for cleanliness, one could perform without hesitation an aseptic operation even in the furnace room. However, it seemed to him that the use of machinery to replace manual labor had been carried to extremes, and that the patients would be better off if the physicians were allowed more individual freedom.

Holfelder referred to the recent endeavor of the Rockefeller Foundation to have the heads of departments receive adequate salaries but be deprived of the right to keep up their private practice. He does not think that such a policy will lead to the desired goal, since most eminent clinical professors will prefer to renounce their professorial duties rather than their private practice. It would also seem to involve a great risk for the character of the instruction if a professor is deprived entirely of the personal contact with patients, which has such a stimulative effect on clinical instruction.

Holfelder noted that the results of laboratory tests play a much greater rôle for diagnosis and therapeutic indications than is the case in Germany. The methods of performing laboratory tests have been so simplified that it has become possible to utilize them on a large scale; but he thinks it would be well for Germany to adopt certain features of American laboratory methods. However, he fears that one result of such extensive application of laboratory tests has been that the clinical examination of the patient has sometimes been relegated to the background to such an extent as to prove harmful to the patient. Especially does this seem to be true in the case of physicians who have not enjoyed the advantages of the first-class medical schools. This condition will be improved when all medical schools have been brought up to the high standard of the best. In regard to the claim that, in a large percentage of cases, rheumatic symptoms can be traced to a focus of infection in the teeth or mouth, Holfelder is somewhat skeptical. He admits that the relationship between a focus of infection in the mouth and rheumatic pains in some distant organ may not have received in Germany the attention it deserves, but he feels equally sure that such a relationship is being assumed in America much more frequently than the facts will warrant.

He was much impressed with the system of blood transfusion as practiced in America, and especially with the organization of details, so that in an emergency case only ten minutes was required to have a donor of the proper blood group on hand ready to furnish up to 1,000 c.c. of his blood. While he feels that many lives are thus saved, there may be a tendency to overdo the matter.

CHILDREN OF WAGE-EARNING MOTHERS

A report of the U. S. Department of Labor, entitled "Children of Wage-Earning Mothers: A Study of a Selected Group in Chicago," states that gainful employment of mothers of young children frequently means that the children receive inadequate care during the day. The report presents the results of a study of 843 families of working mothers, in which were 2,066 children under the age of 14 years. This included 212 colored families. The forty-five day nurseries in Chicago were not maintaining high standards with respect to sanitation and child care, and only two nurseries, with a capacity of twenty each, were available to colored children. Retarded school progress of the children, overfatigue and ill health of the mothers, with consequent loss to the children, and in some instances overwork by children who had the responsibility for household tasks beyond their strength, were other conditions found. More than one third were found below the standard grade for their age in the schools. Measures will be taken for reducing the necessity for wage earning by mothers of young children. These measures will include an improvement of economic conditions that will make the fathers' earnings more nearly adequate; training of mothers in household management and the care of children; preserving the normal family group through movements for the prevention of accidents and the promotion of health, and providing substitutes for the father's support, at his death or when he is incapacitated, by means of mothers' pensions and aid from social agencies.

THE RELATION OF GAS POISONING TO TUBERCULOSIS

Ex-soldiers who were exposed to poisonous gases during the World War have been led to believe that they are likely to develop tuberculosis as a result of such exposure. Hence, although in good health, they are constantly watching for symptoms of consumption. Neither fact nor sound opinion affords any basis, apparently, for this fear. An investigation of this subject was made by the Chemical Warfare Service, and the results have been published. The investigation covered experiments with mustard gas and phosgen on laboratory animals, a study of 2,000 gas cases by a board of officers, the views of many officers of large experience in treating gassed soldiers, and a study of the reports of several European countries.

It was stated in the British report that "tuberculosis does not develop more frequently in gas victims than in other subjects." A similar view was held by the French, who said, "Judging from experience, it does not seem that lung lesions

caused by gassing predispose to tuberculosis." The Germans reported that their "physicians unanimously agree that gassing has no connection with tuberculosis."

The Chemical Warfare Service concluded its investigation by saying: "It is far from convincing that gas played any particular rôle in this connection, and it is doubtful if the incidence of lung tuberculosis among ex-service men is much greater by reason of the part that gas played. Those who claim to have developed tuberculosis a year after leaving the service, from conditions experienced in the army, certainly have no basis for such assertion. They probably would have become tuberculosis patients even if they had never been in the army. . . . There are two elements entering into this problem—one neurasthenic, where the men were gassed, usually very slightly, and believed sincerely that this was a factor in their illness; and second, mistaken diagnosis in many cases, especially those following influenza, in which instances of unresolved bronchopneumonia occurred leaving nodular patches on which the diagnosis of tuberculosis was frequently based on roentgen-ray plates."

Book Notices

VÆ INVENTORIBUS MAGNIS. Por el Dr. Angel Pulido Fernández, V. Presidente del R. C. de Sanidad, Académico. Paper. Pp. 524, with illustrations. Barcelona: Imp. La Renaixensa, 1921.

PRECURSOR, REPRESENTATIVO Y MÁRTIR. Por el Dr. Angel Pulido Fernández, V. Presidente del R. C. de Sanidad Académico. Paper. Pp. 496, with illustrations. Madrid: Imprenta del Instituto Nacional de Sordomudos y de Ciegos, 1921.

These two books, by the venerable president of the superior board of health of Spain, are an eloquent disproof of the old saying that no man is a prophet in his own country. Both, printed at the expense of the government, take up most minutely, perhaps too much so, the achievements of Dr. Jaime Ferrán the scientist, whom the author calls a pioneer in many remarkable medical advances. In fact, Dr. Pulido aims to prove that the whole fabric of modern vaccination, both preventive and curative, has its orign in Ferrán's anticholera work in 1885. The first book goes in detail into the cholera epidemic in 1885; Ferrán's discovery of vaccination as a prophylactic; the attacks made on anticholera vaccination and typhoid inoculation (also introduced by the Spanish bacteriologist before Wright); the unfavorable reports made at the time by the French and Spanish Commission; Cajal's scornful attitude toward the new method; the favorable change in foreign opinion as represented by Klemperer, Guttmann, Roux, Metchnikoff, Calmette and Ehrlich, and finally what he calls Ferrán's martyrdom, i. e., the neglect toward the investigator, who was even expelled from his position as head of the municipal laboratory of Barcelona, although this apparently was due to poor administrative methods on Ferrán's part. The second book deals especially with Ferrán's present theory of tuberculosis and the trial of his antialpha vaccination in Palma de Mallorca and elsewhere. No one could read these well written if prolix books without a feeling of admiration for their gifted author or respect at the sense of duty which impelled him, at the age of 69, following recovery from a serious disease, to devote all his energies to Ferrán's defense and panegyric. After wading, however, through 1,020 pages filled with encomium, satire, literary quotations, attacks on Cajal, reports and speeches, and lacking in actual statistics, one cannot escape the conviction that the story would have gained by being told more concisely and systematically; that Ferrán's own peculiarities and lack of business acumen may have had a great deal to do with his tribulations; that his theory may have been better than his practice; that Cajal's reservations may have been only too well founded and that, after all, Ferrán's conception of the duality of the tubercle bacillus is still *sub judice*. Why make a martyr out of a man who has found thousands of people to submit to his antituberculous inoculations, has his own laboratory, plenty of patients, a number of followers in South America who call him master, has just been given 50,000 pesetas by the government for his antituberculosis work, and, above all, has such an able and earnest advocate as Dr. Pulido to sing his praises in two thick volumes published by the Spanish government?

DISEASES OF WOMEN. By Ten Teachers. Under the direction of Comyns Berkeley, M.D., M.C., Obstetric and Gynaecological Surgeon to the Middlesex Hospital. Edited by Comyns Berkeley, H. Russell Andrews and J. S. Fairbairn. Second edition. Cloth. Price, $10 net. Pp. 641, with 223 illustrations. New York, Longmans, Green & Co., 1922.

A book written by several men in collaboration rarely exhibits unity of purpose or sustained excellence. For this reason one will be agreeably surprised to find how rigorously in this book the individuality of the authors has been subordinated to scholarly production. At the same time the mechanical workmanship has not been neglected. The plates and illustrations are informative, and the index is a joy in its meticulous execution. The order of the subjects is excellent, and the text is consistent, logical and clear. The book is written from the standpoint of the ideal surgeon who is not only openminded but also broad through a mature familiarity with all available resources of our profession. It is a pleasure to come across a treatise which is not disfigured by dogmatism, useless verbiage or futile speculation over exploded or undeveloped hypotheses. Though many of us would be gratified by a somewhat more elaborate and detailed description of the operative technic, it is remarkable how adequately this section has been covered in the allotted fifty pages. It would seem to show that ordinarily much space is wasted in duplication or verbosity. The portion devoted to infections has also been stripped to the bone, and yet the theme advances with marvelously little sacrifice of important matter. A novel and valuable feature is the inclusion of the chapters on appendicitis and acute conditions of the abdomen as definite gynecologic maladies rather than as complications of more generally recognized conditions. The pathology in these cases is so obviously intertwined with the pelvic disorders that we wonder why they have not been admitted heretofore into a frank fellowship. In an effort to imitate the authors in the clarity and succinctness of their style, we may say that the book is a masterly condensation of the principles and practice of modern gynecology; an invaluable compendium for both the student and the practitioner.

GRUNDRISS DER KLINISCHEN THERAPIE INNERER KRANKHEITEN. Von Prof. Dr. Georg Klemperer, Direktor der IV. medizinischen Universitätsklinik Arztl. Unter Mitwirkung von Oberarzt Dr. L. Dünner. Paper. Price, 108 marks. Pp. 237. Berlin: Urban & Schwarzenberg, 1922.

Only a clinician of the widest bedside experience could have written such a book as this. The volume is based on the assumption that the first element in therapy is correct diagnosis, and the book is intended only for those capable of making correct diagnoses. Throughout it stresses the necessity of attention to the details of the individual case; for all patients, no matter what the disease, the mind must be kept at rest, the surroundings agreeable and composed, the food appetizing. It is really interestingly written, which is saying a great deal for a book of therapeutic opinions. One notes certain omissions, for instance, the absence of a discussion of protein sensitization in bronchial asthma and its therapeutic indications. The casual remark on serum therapy in pneumonia leaves one in much doubt. To those American readers who are accustomed to consider the treatment of gastric ulcer as possible along only one royal road, we particularly commend Klemperer's interesting discussion. The treatment of diabetes mellitus used for a long time by Klemperer will evoke a sympathetic response in the followers of the new slogan, "low protein, high fat."

A PSYCHIATRIC MILESTONE. Bloomingdale Hospital Centenary, 1821-1921. Cloth. Pp. 220, with 6 illustrations. New York: The Society of the New York Hospital, 1921.

This volume, printed in 1921, marks the hundredth anniversary of the Bloomingdale Hospital and Asylum. It includes an historical review and addresses by a number of noted neurologists who took part in the anniversary celebration.

Medicolegal

Disability from Typhoid Fever Caused by Drinking Polluted Water

(Wasmuth-Endicott Co. v. Karst (Ind.), 133 N. E. R. 609)

The Appellate Court of Indiana, in affirming an award of the industrial board, under the workmen's compensation act, in favor of plaintiff Karst, says that there was substantial evidence tending to establish that he was in the employ of the defendant company in its factory, where drinking water was furnished from a well, through pipes, it being pumped by stream, and flowing constantly during working hours. Without the company's knowledge, the water became contaminated by seepage from a toilet in the factory. The plaintiff used the water for drinking purposes, without knowledge of such pollution, and became infected with typhoid germs, by reason of which he had an attack of typhoid fever. On this evidence the industrial board found that he received a personal injury by accident arising out of and in the course of his employment.

This court, in determining questions of liability under the workmen's compensation act, has adopted the definition that "an accident is any unlooked-for mishap or untoward event not expected or designed." Applying this definition, it is clear that the entering of typhoid germs into the plaintiff's intestines, by reason of his drinking the polluted water furnished him by the company for that purpose while in its employ, might rightfully be termed an "accident." The next question was as to when the injury could be said to have occurred. It has been said that, in common speech, the word "injury," as applied to a personal injury to a human being, includes whatever lesion or change in any part of the system produces harm or pain or a lessened facility of the natural use of any bodily activity or capability. When that definition is applied to the facts of this case, it is not difficult to determine when the injury resulting from the accident in question occurred. It is well known that typhoid fever is due to a specific micro-organism, known as the typhoid bacillus. The bacillus sets up a catarrhal inflammation of the mucous membrane of the intestines, causing ulcers and fever. When this occurs, the victim evidently sustains an injury. The typhoid bacillus, when taken into the intestines, does not always create a catarrhal inflammation. If it does not, no fever follows, and no injury is sustained. In this case, however, such an inflammation occurred, with resulting fever, constituting an injury within the meaning of the workmen's compensation act.

Nor can it be said that the decision in this case is not in harmony with the limitation of the Indiana statute that "'injury' and 'personal injury' shall mean only injury by accident arising out of and in the course of the employment and shall not include a disease in any form except as it shall result from the injury." It is obvious that, in any given case involving disability so resulting, the inquiry must always be, Did the disease result from an injury by accident, arising out of and in the course of the employment? The injury, however, need not be produced by violence, as the Indiana statute, unlike the statutes of some other states, does not so provide. It suffices in that regard, whatever the accident may have been, if it produces a lesion or change in any part of the system which injuriously affects any bodily activity or capability. When this occurs, and disease follows, causing disability, the right to compensation is not affected by the statutory limitation quoted. But it must be borne in mind that the injury must be by accident arising out of and in the course of the employment. This limitation alone will have the effect of preventing a recovery of compensation for disability resulting from diseases generally, as it is clear that a disease contracted by an employee through such usual intercourse with his fellow workmen as is common among men, and not because of any unusual circumstances connected with his employment, cannot be said to be an accident within the meaning of the workmen's compensation act. The fact that the accident involved in this case occurred while the plaintiff was engaged in quenching his thirst, rather than in the actual performance of some duty which he owed the defendant under his employment, was not a matter of controlling importance, as it is recognized that such acts as are necessary to the life, comfort, and convenience of the workman while at work, though personal to himself, and not technically acts of service, are incidental to the service; and an accident occurring in the performance of such acts is deemed to have arisen out of the employment.

Power to Quarantine Typhoid Carriers

(People ex rel. Barmore v. Robertson et al. (Ill.), 134 N. E. R. 815)

The Supreme Court of Illinois, in remanding the relatrix to the custody of the respondents, says that the latter were the commissioner of health and an epidemiologist of the department of health of the city of Chicago, from whose alleged unlawful restraint of her liberty at her home, as a typhoid carrier, the relatrix sought release through habeas corpus. She had been keeping roomers and boarders, when information came to the department of health that several persons who had previously roomed and boarded at her house had been ill with typhoid fever. She submitted to the department specimens of feces, an examination of which revealed large numbers of typhoid bacilli; but she testified that she had never been sick with typhoid fever; that no member of her family and no boarder or roomer had ever been sick with typhoid fever while living with her, and that so far as she knew no one had contracted the disease by contact with her. The department of health placed her and her house under quarantine, placing a large placard on the house warning all persons that a typhoid carrier resided in the house. The quarantine regulations prescribed required her to remain in her home and forbade her to prepare food for any one but her husband, and forbade any one to come into her home, as roomers or otherwise, unless they had been immunized from typhoid fever.

It is not necessary that one be actually sick, as that term is usually applied, in order that the health authorities may have the right to restrain his liberties by quarantine regulations. Quarantine is not a cure; it is a preventive. As the term is used in this opinion, quarantine is the method used to confine the disease within the person in whom it is detected, or to prevent a healthy person from contracting the infection. Disease germs do not usually travel through the air unaided, but they are carried by insects, by dumb animals and by human beings. Effective quarantine must therefore be not so much the isolation of the person who is sick or affected with the disease as a prevention of the communication of the disease germs from the sick to the well. Thus, in the case of typhoid fever, effective quarantine must include very strict restrictions on the movements of the attendants who in any way come in contact with the sick person or his discharges. It must include the destruction of the bacilli in the feces and the urine, and in the cloths used to wipe the mouth of the patient. Quarantine, in the very nature of the regulation, is not a definite uniform measure, but it must vary according to the subject. One of the important elements in the administration of health and quarantine regulations is a full measure of common sense.

In the case at bar, the state board of health, or a board of health in the city of Chicago, duly organized pursuant to the authority given the city council by the legislature, would undoubtedly have the right to establish reasonable quarantine regulations with respect to the relatrix, so long as she was discharging the germs of a contagious and infectious disease. Whether the authority exists to compel a person apparently well to submit to an examination to determine whether he is a germ carrier was not before this court, for the reason that the relatrix submitted to the examination which revealed that she was such a carrier. The only question presented for determination was whether she was legally and properly detained under quarantine in her home. The statute gives to no such individual as the health commissioner of Chicago authority to make rules and regulations which shall have the effect of law; and the city has no right to give him authority to determine when a contagious and infectious disease exists, and to establish a quarantine. His

authority is limited to carrying into execution orders of a legally constituted board of health. But the department of health of Chicago reported the case of the relatrix to the state department of health, and requested that department to authorize a modified quarantine, which authority was granted, so that the respondents were restraining the relatrix as agents of the state department. She was bound to respect the rules and regulations promulgated by the state department of health respecting the modified quarantine under which she was placed, and for a violation of these rules she was subject to the penalties provided by the statutes. In order that she might know what the rules and regulations were, it was necessary that she be furnished a copy of them.

Sufficient Authority and Statement for Services

(Dalton v. St. Louis & S. W. Ry. Co. (Mo.), 238 S. W. R. 523)

The Springfield (Mo.) Court of Appeals, in affirming a judgment against the defendant railway company for services rendered by the plaintiff as a physician to one Monigold, says that Monigold was found on the right of way of the defendant, with one foot and leg badly crushed. No one saw the accident, but it was inferred that the injury was caused by a passing train. The station agent called the plaintiff over the telephone and asked him to attend Monigold. The plaintiff went, and found the man loaded in a wagon to be taken to his office. The plaintiff was at that time, and afterward, told by the assistant claim agent of the defendant to treat Monigold, and in pursuance with that direction as well as the call from the station agent, he performed the service which was the basis of this action. The leg was amputated below the knee, with the assistance of the defendant's regular physician, who was out of town when the plaintiff was called. After the amputation, the patient was taken in charge by the defendant's physician, but the plaintiff continued in consultation with him until the patient recovered. The plaintiff filed this statement before a justice of the peace:

March 9, 1920.

St. Louis & Southwestern Ry. Co. to Dr. George Dalton, Dr.
March 9, 1920. To professional services rendered as per request on J. W. Monigold.....$200.00

The sufficiency of the statement was challenged by the defendant. The test of its sufficiency was: Did it notify the defendant with reasonable certainty of the nature of the cause of action it was required to meet, and would it bar another action on account of the same subject matter? Measured by this standard, the court thinks the statement was sufficient.

The next contention was that there was no evidence that either the station agent or the assistant claim agent had authority to employ the plaintiff, and thereby bind the defendant, and that the employment itself did not constitute a binding contract. If the employment was authorized, the law would imply a promise to pay the reasonable value of the services rendered, in the absence of an agreement as to the price to be paid. The station agent testified that he had authority to employ a physician in an emergency to attend passengers or employees; and that was the only evidence relating to his authority, while there was no evidence that the injured man was either a passenger or an employee; so that the evidence did fail to show authority in the station agent to make the employment. But the evidence as to what the station agent did was competent to show how the plaintiff was induced to begin the service to the injured man, in connection with what he testified took place immediately thereafter between him and the assistant claim agent. The assistant claim agent testified that his business was to investigate the facts when injuries occurred, and that he had no specific instructions as to what to do in relation to employing physicians; but that he used his own judgment in emergency cases. This, in connection with what he did in this case, was sufficient to take the case to the jury on the question of his authority to act for the defendant in the emergency under which the plaintiff was employed by him in this case. In short, the court does not think that there was any evidence that the station agent had authority to employ the plaintiff to attend Monigold; that the question of the assistant claim agent's authority was a close one on the testimony, and that the jury must have based their verdict on a finding that the assistant claim agent, and not the station agent, had the authority and did employ the plaintiff.

Sale of Practice—Issuance of Prescriptions

(Clabaugh v. Heibner et al. (Mo.), 236 S. W. R. 596)

The Kansas City (Mo.) Court of Appeals, in reversing a judgment obtained by the plaintiff on a note, says that the note was given as part of the $800 consideration for which the plaintiff, a physician, sold his office fixtures, buggy, practice of medicine and good will thereof, in a stated community, to another physician, who will be called the defendant, the plaintiff agreeing that he would not directly or indirectly enter into or engage in the practice of medicine in the city where he had been located, or the country immediately adjacent thereto, as long as the defendant should be engaged in the practice of medicine in the city in question. In a counterclaim, the defendant set up that the plaintiff had violated the agreement, and, on this account, damages were asked, less the amount due on the note. The execution of the note being admitted, the burden was on the defendant to establish his counterclaim. The plaintiff, who subsequently located in a neighboring city, admitted that after the maturity of the note he had practiced in his old location, and about three weeks after the maturity of the note, he wrote to the defendant: "The practice I have done is practice that refused to employ you." So, the court goes on to say, it was beyond question that the plaintiff did practice medicine in that community in violation of his contract not to do so.

It is well settled that contracts of this nature are valid. The good will of a business is a species of property, a thing of value which may be bought and sold, and which the law will protect, awarding damages for injuries thereto. The trial court, however, confined the defendant to evidence of the plaintiff's practice prior to the maturity of the note, and would not allow evidence to be offered as to practice after that date, on the theory that the failure to pay the note when due was a breach of contract on the defendant's part which authorized the plaintiff to disregard the provision obligating him to refrain from practice in that community. That was error. There was no provision in the contract that a failure to pay the note when due would render the terms of the contract void or have any effect thereon. The nonpayment of the note when due was merely a default in the payment of that obligation, not a breach of the other contract. Besides, the failure of the defendant to pay the note when due may have been due to the plaintiff's prior violation of the contract.

In addition to evidence of professional visits and practice carried on by the plaintiff in or around the city where he was first located, the defendant introduced 120 prescriptions issued by the plaintiff to patients residing in the city in question and within eight miles thereof. These prescriptions were filled at a drug store in this city. The issuance of prescriptions in which a physician prescribes remedies he deems appropriate for ailments or diseases is practicing medicine. But the question here was, Where was the practice, in issuing such prescriptions, carried on? It would seem that, if patients went to the plaintiff's office in the other city and consulted him and were examined, treated or received prescriptions there, such acts on the part of the plaintiff would constitute practicing of medicine in the other city, even though the patients in question may have resided in or around the city of his first location and have taken such prescriptions to the latter place, where they were filled. But if the prescriptions were issued under such circumstances as that, either the giving of the prescriptions, or the consultations with or examination of the patients to whom they were given, could be said to have been consummated in or around the city of his first location, then such practice was not in the other city, but within the territory of the contract.

Society Proceedings

COMING MEETINGS

Colorado Congress of Ophthalmology and Oto-Laryngology, Denver, July 28-29. Drs. M. D. Brown and J. M. Shields, Metropolitan Bldg., Denver, Secretary.
Idaho State Medical Association, Wallace, July 10-11. Dr. E. E. Laubaugh, Overland Bldg., Boise, Secretary.
Montana, Medical Association of, Great Falls, July 12-13. Dr. E. G. Balsam, 222 Hart-Albin Bldg., Billings, Secretary.
Utah State Medical Association, Salt Lake City, Aug. 31-Sept. 2. Dr. W. L. Rich, Boston Bldg., Salt Lake City, Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Forty-First Annual Session, held at Huron, May 16-18, 1922

The President, DR. G. S. ADAMS, Yankton, in the Chair

Syphilis in General Practice

DR. A. A. MCLAURIN, Pierre: The spirochete has invaded the lymph and blood streams before the primary lesion develops. Any lesion of the external genitalia, regardless of its appearance or duration, should be considered syphilitic until proved otherwise. Caustics applied to these lesions delay the diagnosis and expose the patient to unnecessary danger.

Practical Suggestions in Diagnosis and Treatment of Pulmonary Tuberculosis

DR. F. W. WITTICH, Minneapolis: The patient should rest for half an hour before and after meals; should take the temperature and pulse before arising in the morning, or, if remaining in bed, at 7:30 a. m. and at 4 and 8 p. m., and should remain in bed for at least six weeks or until the temperature and pulse are normal and there is a gain in weight. Before taking exercise by walking, he should commence activities by going to the evening meal. If the temperature remains normal at 8 p. m., he should go to two meals and finally to all three. If there is a rise, he is exceeding his exercise and must remain in bed until it remains normal for three days. Before walking exercises are begun, he should try to dress himself, try sitting in a reclining chair out doors as much as possible, and going to meals. After doing this for several days without increase in cough or expectoration, and temperature and pulse, he should begin to take fifteen minute walks in the middle of the forenoon. He should return to bed or recline in the chair and take the temperature and pulse at once, rest for half an hour, and take them again. If they are above normal, it means that he is exceeding his exercise. He should be weighed each week, if possible, when on exercise. Between the walking exercises he should remain in the open as much as the weather will permit. He should go to bed every afternoon after lunch until 4 o'clock. Lunches consisting of a glass of milk, buttermilk, malted milk and crackers may be taken at 10:30 a. m. and 4 p. m. The voice should be rested as much as possible, also the lungs, by avoiding long conversations. When the voice is hoarse and the throat sore, he should whisper. He should be in bed with the lights out at 9 p. m. The patient should try to avoid crocheting, letter writing, and even reading for at least an hour after the noon meal. The cough should be controlled as much as possible, and gauze or a paper napkin held in front of the mouth when coughing. These should be placed in a paper bag pinned to the mattress at the head of the bed, and burned each day. The dishes should be washed and scalded separately.

Relation of Laboratory to Clinical Medicine

DR. J. C. OHLMACHER, Vermilion: A few of the things that make for the ideal in group and hospital practice are: (1) The union of medical men in the various spheres of medical activity, whose paramount interests concern the welfare of the patient and the scientific and ethical advancement of their profession. (2) Thorough and up-to-date equipment in clinic and wards. (3) An up-to-date library. (4) Holding weekly or semiweekly conferences, at which cases may be discussed, and topics of interest concerning new scientific medical advancements considered. (5) Encouragement of clinical and laboratory investigations. (6) Establishment of a completely equipped laboratory where all the usual routine and the newer methods of laboratory diagnosis and original research may be carried on under the supervision of a competent pathologist. (7) Recording and filing of case histories, including clinical findings, laboratory findings, treatment, necropsy findings, etc., and the publication of papers in reference to cases of special interest, and articles covering clinical and laboratory research or the publication of a yearly or biennial bulletin containing matters of interest or value to the profession. There is a great need to standardize laboratory methods. Those having charge of laboratories should be licensed by some governing agency capable of raising and maintaining the standard of requirements to such a degree as to weed out all incompetents.

Inflammatory Conditions of the Mastoid Process and the Middle Ear

DR. A. A. SORNSEN, Aberdeen: There are two common forms of acute middle ear inflammation, in both of which the subjective symptoms may be identical and the indications for treatment very similar. The first is that known as acute catarrhal otitis media, generally related to such affections as rhinitis and influenza; to septic hypertrophied adenoid tissue in the nasopharyngeal vault, or to the presence of certain micro-organisms, being commonly an extension of a nasopharyngeal infection through the eustachian tube, and capable of assuming a subacute or even chronic form. A second form is acute purulent or suppurative otitis media, which is always of bacterial origin, often resulting from the entrance of such organisms as the pneumococcus, staphylococcus, streptococcus or influenza bacillus into the tympanic cavity by way of the eustachian tube, where they produce inflammation. Such micro-organisms are often associated with such a general systemic infection as pneumonia or typhoid, or may result from a tonsillitis or septic nasopharyngitis.

Recent Developments in Radiotherapy

DR. R. F. BELLAIRE, Sioux City, Iowa: Surgery should take precedence over all other forms of treatment unless the case is inoperable: then surgery is secondary to the roentgen ray or to radium. Deep therapy with the roentgen ray is in a very vital period of transition. To kill deep seated growths it is absolutely essential to introduce into the deep structures a 100 per cent. dose. The ratio between the skin and depth dose must be about equal. In certain forms of sarcoma the ratio may be as low as 60 or 80 per cent. of the total skin dose. For the production of deep lethal doses, tremendously high voltages must be utilized. Of all the factors concerned, high voltage is the most indispensable, because voltage determines the force with which the rays are projected into the tissues. The higher the voltage, the shorter the wave length; the shorter the wave length, the greater the velocity of the rays. If, therefore, sufficient voltage can be generated for the introduction into the deep parts of lethal doses without destroying the overlying skin, we shall have advanced tremendously toward the solution of the cancer problem.

Complications of Prostatectomy

DR. FRANKLIN R. WRIGHT, Minneapolis: Complications of prostatectomy naturally divide themselves into three groups: those which occur at the operation, those which occur immediately following operation, and those which take place during the healing process. Those which occur at the time of the operation are the accidental opening of the peritoneum, and hemorrhage. This accident is not of serious nature. Hemorrhage at the time of operation may be anything from a slight loss of blood to one which threatens the patient's life. Troublesome hemorrhage may come from the edge of the bladder mucous membrane where, during the enucleation, the urethral mucous membrane was torn from it, or may come as a general oozing from the surface of the cavity from which the tumor was enucleated. Neither of these two forms is serious. The third form of hemorrhage is of serious

nature. If, in attempting to enucleate the tumor from the prostate, the prostatic sheath is torn, a venous plexus is torn, and the hemorrhage is alarming. The prognosis in these cases is not good. We can control hemorrhage; but as virtually all these bladders are septic, the clots which form under the packing in the torn veins become septic, and patients die of general sepsis about the fifth or sixth day. Complications immediately following operation are uremia, reflex conditions and infections.

Pathogenic Ptosis of Right Colon

Dr. E. P. Quain, Bismarck, N. D.: Coloptosis is a very common anatomic abnormality. Comparatively few coloptotic patients suffer serious symptoms. Some of the effects of coloptosis are translated to other abdominal organs which may then give rise to a new set of symptoms based entirely on the complication, and obscuring the original and chief cause. Medical treatment gives relief in most cases and should be given thorough trial in all cases, but its ability to cure is doubtful in any case. Surgical treatment is as successful in these lesions as in many other so-called surgical diseases and promises better results as experience accumulates.

Pyuria in Infancy and Childhood

Dr. Henry F. Helmholz, Rochester, Minn.: I use the term pyuria rather than pyelocystitis or pyelitis because often pyuria is the only diagnosis permissible from the symptoms and physical findings. The pus may be obtained from the vagina, urethra, bladder, ureters, pelvis or substance of the kidneys. Catheterization merely discloses the presence or absence of inflammation in the bladder or urinary tract above. It seems hardly justifiable, in view of the relatively benign course of most infections of the bladder and kidneys, to make general use of ureteral catheterization in infants and children. Occasionally the tuberculosis bacillus alone may give rise to pyuria, although in the majority of cases the colon bacillus is present as a secondary invader. Sometimes cases are observed in which the cultures are sterile and the possibility of a tuberculous infection can be excluded by stains, cultures and animal inoculation, even though there are large amounts of pus in the urine. Pyuria may be part of a general pyemic process with numerous abscesses in the cortex or medulla of the kidneys. Sometimes these abscesses occur only in the kidneys and give rise to a severe type of pyuria, closely resembling pyelitis and to be distinguished from it only at necropsy. Pyuria is virtually always produced by hematogenous infection localizing in the renal cortex and forming abscesses which, on draining into the pelvis, may set up pyelitis. A second type of renal involvement is that secondary to the usual pyelitis which, after running a rather chronic course, suddenly becomes extremely acute. The process is a pyelonephritis without abscess formation resulting in a complete shut-down of the kidney. A third type of disease of the kidney is that associated with the damming back of the urinary flow due to obstruction from any cause, and a localized breakdown of the substance of the kidney into multiple abscesses. A fourth type of involvement is ordinary primary pyelitis, which unquestionably is very much more common among girls. A fifth type is pyuria secondary to infections other than those in the urinary tract, following tonsillitis, bronchitis, otitis and other pyogenic infections. This type, usually recognized only by examination of the urine, there being practically no symptoms pointing to involvement of the urinary tract and increased temperature, if present, is assumed to be due to the primary infection. Water is the most important single item in all treatment. For infants 1 year old fluid intake should reach from 1½ to 2 quarts every twenty-four hours. If necessary, fluids may be given by rectum, or by intraperitoneal, subcutaneous and intravenous injection. Infants may also be given sodium citrate and sodium bicarbonate, 60 grains in twenty-four hours; the dose may be doubled every forty-eight hours until the urine becomes alkaline. In certain cases hexamethylenamin and acid sodium phosphate may be used. Local treatment by ureteral catheterization and pelvic lavage may be tried as a means of last resort.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Boston Medical and Surgical Journal

June 8, 1922, **186**, No. 23

Decreasing Diabetic Mortality: Increasing Incidence of Glycosuria. E. P. Joslin, Boston.—p. 761.
*Divided Meals for Severe Diabetics. H. Gray, Boston.—p. 763.
*Advantage of Multiple Meals in Treatment of Severe Diabetes. T. Murayama, Boston.—p. 768.

Divided Meals in Diabetes.—The theory of divided meals appears to be activation of the liver or pancreas by a small, preliminary meal of carbohydrate given one or two hours before each main meal; the organism being then in action at the time of that regular meal responds to the food load more vigorously than with the everyday three meal schedule. The results obtained by Gray indicate that the method does help to lower the blood sugar. The method is, therefore, advocated by him as having practical value.

Multiple Meals in Diabetes.—The experiments described by Murayama suggest that the gratifying result obtained in a severe case of diabetes is ascribed to the giving of six split meals, but it is possible that the lower carbohydrate fat ratio in the divided meal period may have also been a factor. Absolute proof would not be furnished unless the identical diet, both in variety and quantity, should be given the same patient as three meals under the same conditions for a definite time. The justification for this paper is rather the fact that such an intractable glycosuria, withstanding many efforts at desugarization, disappeared with the new divided diet.

Illinois Medical Journal, Oak Park

June, 1922, **41**, No. 6

Problem of Medical Parasite. C. E. Humiston, Chicago.—p. 413.
Cholecystitis, Its Influence on Upper Abdominal Pathology. B. B. Davis, Omaha, Neb.—p. 417.
Malpractice Suits as They Relate to Medical Profession. C. U. Collins, Peoria, Ill.—p. 422.
Surgical Treatment of Gastric and Duodenal Ulcer with End Results of Gastro-Enterostomy. C. A. Stevens, Chicago.—p. 428.
Associated Pathology of Appendicitis. F. D. Moore, Chicago.—p. 431.
Practical Perimetry. H. S. Gradle, Chicago.—p. 435.
Schick Test and Control of Diphtheria. R. P. Peairs, Bloomington, Ill.—p. 439.
Interpretation of Gastric Symptoms. A. A. Goldsmith, Chicago.—p. 441.
Occult Disease of Childhood. J. C. Gittings, Philadelphia.—p. 445.
*Subcutaneous Rupture of Trachea. L. H. Zeuch, Chicago.—p. 451.

Subcutaneous Rupture of Trachea.—To the fifty-three cases recorded in the literature Zeuch adds one case. A boy, aged 7, while playing the game of horseshoes, stumbled over a tricycle lying on its side. His neck struck the pedal and on rising his parents noticed a swelling in his neck, which was rapidly increasing, extending to the face and body. The pain was inconsiderable and no external evidence of injury was discernible. On examination Zeuch noticed a cushion of air two inches thick extending from the head to the thorax, abdomen and scrotum. Every inspiration increased the emphysema and the boy was becoming cyanotic and gasping for air. Zeuch made four punctures with a small lance through the skin, anteriorly and posteriorly over the thorax. A sizzling sound followed, such as the escape of air causes in a small puncture of an automobile inner tube. At operation a transverse rent was observed between the second and third cartilage completely across, the segments held only by its muscular coat posteriorly. The rent was closed by sutures. The boy recovered.

Johns Hopkins Hospital Bulletin, Baltimore

May, 1922, **33**, No. 375

Evolution of Human Races in Light of Hormone Theory. A. Keith, London.—p. 155.
Pharmacologic Action of Epinephrin on Sphincter Pylori of Fetus. P. G. Shipley and K. D. Blackfan, Baltimore.—p. 159.
*Occurrence of Anemia in Rats on Deficient Diet. W. M. Happ, Baltimore.—p. 163.

*Significance of Influenza Bacilli. A. L. Bloomfield, Baltimore.—p. 172.
*Intercolumnar Tubercle, an Undescribed Area in Anterior Wall of Third Ventricle. T. J. Putnam, Baltimore.—p. 181.
*Pseudomyxoma Peritonei. E. Novak, Baltimore.—p. 182.
*Histamin as an Inflammatory Agent. W. Bloom, Baltimore.—p. 185.
*Treatment of Nonencapsulated Brain Tumors by Extensive Resection of Contiguous Brain Tissue. W. E. Dandy, Baltimore.—p. 188.
II. Diagnosis, Localization and Removal of Tumors of Third Ventricle. W. E. Dandy, Baltimore.—p. 188.
III. Cerebral Ventriculoscopy. W. E. Dandy, Baltimore.—p. 189.
IV. An Operation for Removal of Large Pituitary Tumors. W. E. Dandy, Baltimore.—p. 189.
V. An Operative Procedure for Hydrocephalus. W. E. Dandy, Baltimore.—p. 189.
VI. Diagnosis and Localization of Spinal Cord Tumors. W. E. Dandy, Baltimore.—p. 190.
Spontaneous Labor Occurring Through Obliquely Contracted, Kyphotic, Funnel Pelvis. J. W. Williams, Baltimore.—p. 190.

Anemia on Deficiency Diets.—Happ asserts that well balanced diets, deficient in iron, do not produce anemia in the rat in the first generation, nor do diets consisting solely of cow's milk or milk and bread. Slight anemia may occur in rats of the second generation on these diets. Diets deficient in fat soluble A or water soluble B, although they cause severe nutritional disturbances, do not produce anemia in the rat. Diets so deficient in water soluble B as to produce polyneuritis diminish leukopoietic activity and cause a severe leukopenia with a shift to the right in the Arneth formula. Diets low in an organic substance contained especially in cod liver oil with a low calcium but high phosphorus content, which produce rickets-like changes in the rat, may also produce anemia, provided the animal is kept for a long period on the diet. Animals of the second generation on this diet may also become anemic. This anemia is associated with evidences of increased hematopoietic activity. There is often an enlargement of the spleen. This condition resembles the anemias seen in association with rickets in human beings. A diet low in the organic substance contained in cod liver oil and low in phosphorus with a normal calcium content, a diet that produces severe rickets with great uniformity, does not produce anemia.

Significance of Influenza Bacilli.—The main results of Bloomfield's work may be summarized as follows: In the first place it appears that the general incidence of influenza bacilli in the throats of healthy people has declined greatly since the time of the pandemic, the present figure being comparable to that which existed before the wave of influenza in 1918. Furthermore, there seems to be no striking relationship to the season of the year or to the prevalence of minor respiratory infections. An outstanding feature of the carrier state in the persons observed was its usual relatively brief duration and the absence of evidence in the case of healthy people of localization of influenza bacilli in a localized area of diseased tissue such as the tonsil.

Intercolumnar Tubercle in Third Ventricle.—A structure in the anterior wall of the third ventricle of the mammalian brain is described by Putnam which appears to be analogous in many ways with the well known areae postremae of the fourth ventricle. It is a small prominence, up to one millimeter in diameter, situated between the columns of the fornix, at the level of the upper border of the foramina of Monro, below the juncture of the two lateral choroid plexuses. It is composed of a peculiar loose neuroglia tissue, containing many coarse capillaries, and covered by low ependyma. In the human brain it contains small nerve cells. The adventitia of the capillaries takes up trypan blue and other vital dyes intra vitam. No function can at present be assigned to it. The name intercolumnar tubercle is suggested for this structure.

Pseudomyxoma Peritonei.—In the male, Novak says, pseudomyxoma peritonei nearly always occurs from the rupture of a gelatinous cyst of the appendix. In rare cases it may possibly arise elsewhere, e. g., in the retroperitoneal tissues. In the female this condition may be due either to ovarian or to appendiceal disease. Sometimes both ovary and appendix are affected, and it may be difficult to say which is responsible for the peritoneal involvement. In such cases the chemical nature of the secretion may be valuable evidence.

Histamin Not an Inflammatory Agent.—A number of experiments were performed by Bloom to determine the inflammatory inciting and chemotactic properties of histamin. In none of these experiments did histamin produce an inflammatory reaction more marked than that caused by the control experiments. Histamin is indifferent with respect to chemotaxis in vivo and in vitro.

Treatment of Nonencapsulated Brain Tumors.—Gliomas comprise probably 80 per cent. of brain tumors; they are never encapsulated, some are circumscribed, others infiltrating. The fact that they invariably recurred has rendered operative procedures apparently hopeless. In recent work, however, Dandy and his associates have made trial of careful resection, en masse, of a zone of normal brain tissue with the tumor in the center. They have removed an entire right or left frontal lobe without any observable mental or other after-effect. Whole right temporal or right occipital lobes have been removed with only a contralateral homonomous hemianopsia. In two instances, it has been necessary to resect the right temporal lobe and the occipital lobes. Virtually complete resection of one or two lobes of the cerebral hemispheres has been done in about ten instances, but partial resection of a lobe with the tumor is frequently all that is necessary. The exact amount of brain tissue which must be removed depends on the position, size and character of the tumor. Partial or even complete resection of lobes of the brain entails very little operative risk. The two largest resections were done when the patients were unconscious, and complete recovery followed. Similarly, glioma of the cerebellum can be removed by resecting large portions of the cerebellum. Three times the entire vermis was removed and no symptoms have followed. Two boys, 10 years old, are well and working four years after removal of the tumor together with all of the vermis and about half of each lateral lobe of the cerebellum.

Journal of Bacteriology, Baltimore

May, 1922, **7**, No. 3

Cultural Requirements of Bacteria. I. J. H. Mueller New York.—p. 309.
Studies on Cultural Requirements of Bacteria. II. J. H. Mueller, New York.—p. 325.
Method for Counting Number of Fungi in Soil. S. A. Waksman.—p. 339.
Thermophilic Bacteria. I. Aerobic Thermophilic Bacteria from Water. L. E. Morrison and F. T. Tanner, Urbana, Ill.—p. 343.
An Apparatus for Rapid Measurement of Surface Tension. R. G. Green, Univ. of Minn.—p. 367.

Journal of Biological Chemistry, Baltimore

May, 1922, **52**, No. 1

Possible Source of Error in Bell-Doisy Method for Determination of Phosphates in Blood Plasma. W. W. Denis and L. von Meysenbug, New Orleans.—p. 1.
*Chemical Changes of Blood Under Influence of Drugs.—1. Ether. H. V. Atkinson and Harold N. Ets, Chicago.—p. 5.
*Occurrence of Creatinin and Creatin in Blood. J. A. Behre and S. R. Benedict, New York City.—p. 11.
Method for Quantitative Estimation of Minute Amounts of Gaseous Oxygen and Its Application to Respiratory Air. H. F. Sheaff, Chicago.—p. 35.
Differential Precipitation of Proteins of Colostrum and Method for Determination of Proteins in Colostrum. P. E. Howe, Princeton.—p. 51.
Metabolism and Respiratory Exchange in Poultry During Vitamin Starvation and Polyneuritis. R. J. Anderson and W. L. Kulp, Geneva, N. Y.—p. 69.
Nitrogen Nutrition of Yeast. F. K. Swoboda, Chicago.—p. 91.
*Chemical Studies of Intestinal Intoxication. 1. Presence and Significance of Histamin in Obstructed Bowel. R. W. Gerard, Chicago.—p. 111.
*Utilization of Calcium and Phosphorus of Vegetables by Man. N. R. Blatherwick and M. L. Long, Santa Barbara, Calif.—p. 125.
Method of Quantitative Determination of Trypsin. Modification of Gross' Method. Sotara Kai, Cincinnati.—p. 133.
Partial Pressure of Oxygen in Blood During Progressively Induced Anoxemia. C. W. Greene, Columbia, Mo., and C. H. Greene, Rochester.—p. 137.
Quantitative Study of Adsorption in Solution and at Interfaces of Sugars, Dextrin, Starch, Gum Arabic and Egg Albumin, and Mechanism of Their Action as Emulsifying Agents. G. L. Clark and W. A. Mann, Nashville.—p. 157.
Action of Muscle Tissue on Fumaric, Maleic, Glutaconic and Malic Acids. H. D. Dakin, Sarborough-on-Hudson, N. Y.—p. 183.

Determination of Fatty Acids (and Cholesterol) in Small Amounts of Blood Plasma. W. R. Bloor, K. F. Pelkan, and D. M. Allen, Berkeley.—p. 191.
Human Digestion Experiments with Raw White of Egg. C. G. L. Wolf, Cambridge, England.—p. 207.
Nutritional Adequacy of Proteins of Chinese and Georgia Velvet Beans with Reference to Amino-Acid Composition. D. B. Jones, A. J. Finks and H. C. Waterman, Washington.—p. 209.
Colorimetric Method for Determination of Small Amounts of Magnesium. F. S. Hammett and E. T. Adams Philadelphia.—p. 211.
New Color Reactions of Cholesterol. L. Kahlenberg, Madison.—p. 217.
Synthesis of α-Hydroxyisopentacosanic Acid and Its Bearing on the Structure of Cerebronic Acid. P. A. Levene and F. A. Taylor, New York.—p. 227.
*Antiscorbutic Vitamin. 1. Its Solubility from Desiccated Orange Juice. E. B. Hart, H. Steenbock and S. Lepkovsky, Madison.—p. 241.
Digestibility of Raw Rice, Arrowroot, Canna, Cassava, Taro, Tree-Fern and Potato Starches. C. F. Langworthy and H. J. Deuel, Jr., Washington, D. C.—p. 251.
Method for Determination of Small Amounts of Lactic Acid. S. W. Clausen, St. Louis.—p. 263.
*Mineral Metabolism of Milch Cow. E. B. Forbes, J. A. Schulz, C. H. Hunt, A. R. Winter and R. F. Remler, Wooster, Ohio.—p. 281.
Studies of Uric Acid. 1. Examination of Variables in Folin and Wu Uric Acid Method. G. W. Pucher, Buffalo.—p. 317.
Id. 2. Modification of Folin and Wu Uric Acid Method. G. W. Pucher, Buffalo.—p. 329
A. Saponin from Agave Lechuguilla Torrey. C. O. Jones, L. H. Chernoff and A. Viehoever, Washington, D. C.—p. 335.

Effect of Drugs on Blood Sugar.—Atkinson and Ets found that the blood sugar content during ether administration, also the hydrogen ion value, is raised and the carbon dioxid capacity of the blood plasma decreased. The cause of the rise in the sugar may be related to: (*a*) the increase in the hydrogen ion which corresponds to a decrease in the p_H; and (*b*) the decrease in the carbon dioxid capacity of the blood plasma. The fat decreased during the ether narcosis and then showed an after rise above normal. The cholesterol and lecithin change very little.

Creatin and Creatinin Metabolism.—Any theory of creatin and creatinin metabolism, Behre and Benedict hold, must take into account the fact that creatin circulating in the blood appears to be essentially a waste product. The view proposed by them attempts to do this, and is the only view so far put forward which takes account of the increased blood creatin after impaired kidney function.

Histamin in Obstructed Bowel.—Histamin was found by Gerard in the contents of isolated closed loops of the large or small intestine. The amount varied in different samples; from 2 to 3 mg. of histamin dihydrochlorid per 100 c.c. of fluid being a fair minimum average. A combined histamin derivative is also present in obstruction fluid. Evidence is presented that this is of peptid nature. The sterile secretion of jejunum contains no histamin. Sterile mucosa of the jejunum contains histamin, as does the mucosa of closed loops of the jejunum. Histidin is present in loop fluid and mucosa. Histamin is carried down in heat and acid coagula of loop fluid, and small amounts may be absorbed in the alcohol precipitate from loop fluid.

Calcium and Phosphorus in Vegetables.—Data are presented by Blatherwick and Long, which indicate that calcium and phosphorus derived from vegetables are capable of meeting the maintenance needs of man.

Antiscorbutic Vitamin in Orange Juice.—The antiscorbutic vitamin of desiccated orange juice Hart et al. found to be soluble in 80 and 95 per cent. and absolute ethyl alcohol. It is also soluble in methyl alcohol. The investigations of others show that it is also soluble in water, but these experiments do not exclude the influence on solubility of the salts inherent in the material extracted. This vitamin of desiccated orange juice was found to be insoluble in butyl alcohol as well as in benzene, petroleum ether, acetone, ether, chloroform and ethyl acetate. The behavior of this vitamin toward organic solvents and water indicates that it is not of fat or lipin character.

Mineral Metabolism of Milch Cow.—The results of the investigation reported on by Forbes et al. suggest the desirability of building up extensive mineral reserves in growing heifers by liberal allowance of feeds rich in mineral nutrients, and also the importance of a dry, resting period of adequate length to permit the restoration of all previous nutrient overdrafts, with liberal feeding during this period.

Journal of Immunology, Baltimore

May, 1922, **7**, No. 3

Immunologic Studies on Types of Diphtheria Bacilli. W. H. Park, A. W. Williams and A. G. Mann, New York.—p. 243.
*Relationship of Lipoids and Proteins to Serum Reactions in Tuberculosis. W. R. Hodge and M. F. MacLennan, Toronto.—p. 253.
Toxicity of Acids for Leukocytes, as Indicated by Tropin Reaction. A. C. Evans, Washington, D. C.—p. 271.

Relation of Lipoids and Proteins to Serum Reactions in Tuberculosis.—Evidence is introduced by Hodge and MacLennan which indicates that the fixation bodies in human tuberculous serum are either removed or destroyed by extraction of the dried serum with alcohol, chloroform or ether, and that the substances responsible for the inhibiteur reaction of Calmette are identical with those responsible for the inhibitive reaction of Caulfeild.

Journal of Medical Research Boston

April-May, 1922, **43**, No. 2

Experimental Production of Macrophages in Circulating Blood. M. E. Simpson, San Francisco.—p. 77.
Immunity in Relation to Transplanted Tissue. M. S. Fleisher, St. Louis.—p. 145.
Cultural Stud of Anaeobic Spore-Bearing Bacteria with Strains Isolated by Barber Single Cell Technic. M. C. Kahn, New York.—p. 155.
Adaptive Changes of Heart Muscle. W. D. Collier, Columbia, Mo.—p. 207.

Medicine, Baltimore

May, 1922, **1**, No. 1

Therapeutic Use of Digitalis. G. C. Robinson, Nashville, Tenn.—p. 1.
Treatment of Meningococcus Meningitis. K. D. Blackfan, Baltimore.—p. 139.

Nebraska State Medical Journal, Norfolk

June, 1922, **7**, No. 6

What Surgery Offers in Gallbladder Disease. J. B. Deaver, Philadelphia.—p. 185.
Infections Following or Complicating Tonsillectomy and Adenectomy. E. D. Brooks, Lincoln, Neb.—p. 190.
Field of Operation. R. W. Fouts, Falls City, Neb.—p. 194.
Simulation of Ectopic Pregnancy. C. H. Waters, Omaha, Neb.—p. 196.
Puerperal Sepsis. R. T. Van Meter, Fremont, Neb.—p. 201.
*Anthrax: Report of Case. M. G. Wohl and J. E. Pulver, Omaha, Neb.—p. 202.
Breast Tumors. C. C. Johnson, Lincoln, Neb.—p. 204.

Anthrax After Shaving.—In the case cited by Wohl and Pulver the lesion, situated on the right side of the neck, followed shaving. The diagnosis was confirmed by cover slide preparations, culture and guinea-pig inoculation. The patient was given intramuscular injections of antianthrax serum: 10 c.c. six successive times at four hour intervals. The serum was also injected locally around the lesion. At the end of three weeks, the eschar was removed surgically, and the lesion healed without any complications. The patient made a complete recovery.

New York Medical Journal and Medical Record

June 7, 1922, **115**, No. 11

Malignancies of Colon. J. F. Erdmann and R. F. Carter, New York.—p. 649.
Acute Intestinal Obstruction. A. F. R. Andresen, Brooklyn.—p. 653.
Acute Intussusception. T. T. Thomas, Philadelphia.—p. 656.
Fluoroscopy in Diseases of Abdominal Organs. A. L. Holland, New York.—p. 659.
Symptom Pain in Diagnosis of Appendicitis. P. A. D'Acierno, Weehawken, N. J.—p. 663.
Cause and Prevention of Gastrojejunal and Jejunal Ulcer. A. O. Wilensky, New York.—p. 668.
Dietetic and Treatment Regulations in Gastroduodenal Ulcer. A. Bassler, New York.—p. 670.
Some Difficulties in Diagnosis of Peptic Ulcer. A. W. Hammer, Philadelphia.—p. 672.
Acute Perforation of Gastric and Duodenal Ulcer. A. H. Noehren, Buffalo, N. Y.—p. 674.
Problems and Progress of Gastric Ulcer Surgery. W. Van Hook, Chicago.—p. 678.
Recognition and Treatment of Minor Ailments of Digestive System. M. Einhorn, New York.—p. 681.
*New Technic for Preparation of Bacillus Acidophilus Milk and Its Therapeutic Value. A. A. Eggston and N. P. Norman, New York.—p. 683.
Radiological Diagnosis of Primary Carcinoma of Ascending Colon with Metastasis to Jejunum. I. Glassman, New York.—p. 686.
Chronic Colitis in Neuropsychiatric Cases. J. W. Visher, Twin Falls, Idaho.—p. 688.

Importance of Roentgen Ray Localization of Intestinal Tube. J. Buckstein, New York.—p. 690.
Comparison of Successive Aspirates of Gastric Contents. B. C. Lockwood and H. J. Jacobson, Detroit.—p. 693.
Standardization of Test Meal. V. Knapp, New York.—p. 695.
Fernand Widal. M. W. Thewlis, Paris.—p. 699.

Preparation of Bacillus Acidophilus Milk. — Eggston and Norman claim to have produced a milk that is white in color, of a nonlumpy consistency, with practically no odor and in which they can regulate the fat content to suit the requirements of the patient. The milk can also be made with an acid or slightly sweetish taste. This can be done without altering the bacterial count. The white acidophilus milk is prepared in the following way: One pint of tap water is placed in a liter flask. If one wishes a sweet tasting milk, a heaping tablespoonful of lactose is added to the water, which is then autoclaved for twenty minutes under twenty-five pounds pressure. The water is cooled and a pound tin of unsweetened, evaporated milk is added to the flask, observing sterility. The mixture is inoculated with 10 c.c. of a stock culture of Bacillus acidophilus under aseptic technic, shaken and incubated for twenty-four hours at 99 F. The curd formed will be soft, white and slightly separated from the whey at the top. The flask is shaken to break the curd, refrigerated, and the milk is ready for use. The acidity of the milk is controlled by the incubation period—the longer it incubates the more acid it becomes. The fat content may also be regulated by varying the amount of water or milk.

Ohio State Medical Journal, Columbus

June, 1922, **18**, No. 6

Acute Mastoiditis. S. S. Quittner, Cleveland.—p. 405.
Cardiac Arrhythmias and Their Clinical Recognition. R. S. Morris, Cincinnati.—p. 408.
Medical Service in Industry. C. E. Ford, New York.—p. 412.
Harelip and Cleft Palate. C. M. Clark, Akron.—p. 417.
Stem Pessary. A. F. Spurney and P. M. Spurney, Cleveland.—p. 424.
Local Anesthesia Especially in Tonsillectomies. C. A. Campbell, Steubenville.—p. 426.
Medical Profession. W. Teachnor, Columbus.—p. 429.

Pennsylvania Medical Journal, Harrisburg

June, 1922, **25**, No. 9

*Surgical Treatment of Cancer of Large Intestine. G. W. Crile, Cleveland.—p. 599.
*Practitioner's Part in Acquiring Knowledge Necessary for Intelligent Interpretation of Atypical Wassermann Reactions. S. R. Haythorn, Pittsburgh.—p. 602.
Cytology of Cerebrospinal Fluid. J. H. Whitcraft, Wilkinsburg.—p. 606.
*Urea Concentration Test for Kidney Function. E. Weiss, Philadelphia.—p. 607.
*Moss-Agate Tracheal Sputum. C. Jackson, Philadelphia.—p. 613.
Spasmophilia. J. M. Higgins, Sayre.—p. 616.
Mental Side of Thyroid Hyperthyroidism. M. H. Weinberg, Pittsburgh.—p. 618.
*Circulatory Efficiency in Cardiac Disease. C. C. Wolferth, Philadelphia.—p. 624.
Case of Mercuric Chlorid Poisoning. A. Ellsworth, Warren.—p. 629.
Prevention of Mental Disease. A. Gordon, Philadelphia.—p. 630.

Mortality of Resection of Cancer of Colon.—The mortality rate for resection of the large intestine for carcinoma, which has ranged from 15 to 45 per cent., Crile shows has been reduced to 2 plus per cent. and cases hitherto considered inoperable have been brought within the range of operability.

Value of Wassermann Test.—A correlative review made by Haythorn of the clinical and laboratory records of 6,387 Wassermann tests made under as nearly constant conditions as possible, indicates that the partially positive or atypically test has a place of distinct value in the diagnosis and the control of the treatment of syphilis.

Urea Concentration Test for Kidney Function. — Weiss regards the urea concentration test as a simple and fairly reliable method of determining the efficiency of the kidney, but, notwithstanding certain theoretic advantages which it possesses over other methods, practically it is not ideal and should, therefore, be considered a useful adjunct test to be employed in conjunction with other methods, the whole being weighed with the clinical data in an evaluation of a case of renal disease.

Moss Agate Tracheal Sputum in Chronic Tracheitis.—Moss agate tracheal sputum is the name given by Jackson to a characteristic secretion seen in cases of chronic tracheitis. The characteristics are: (*a*) A gray color. (*b*) A degree of opalescent translucency. (*c*) A dark mottling which gives to the sputum an appearance like a gray moss agate stone. (*d*) A more or less globular form of sputum mass. (*e*) A tough tenacious consistency, sometimes gelatinous. (*f*) A tendency, at times, to be projected from the mouth in coughing. (*g*) A tendency to accumulate in the larynx, whence it is removed by cough or by semicough. (*h*) When it accumulates on the cords it often causes diplophonia by creating temporary nodal points. (*i*) A scantiness in quantity as compared to the sputum of most bronchial and pulmonary diseases.

Circulatory Efficiency in Cardiac Disease.—Wolferth asserts that to evaluate the cardiac function, it is necessary to consider how efficiently the circulation performs under the stresses of everyday life as well as special loads. The possible effects of disease outside the heart which may influence circulatory function must be weighed. It may be misleading to form an opinion of cardiac function based on a single type of test, or worse still, on only one of the reactions to such a test. In the absence of a satisfactory test, all the available data must be taken into account.

Porto Rico Medical Association Bulletin, San Juan

April 30, 1922, **16**, No. 136

*Serodiagnosis of Sprue. I. González Martínez.—p. 51.
Medical Sciences in Porto Rico. Opening Address. M. Quevedo Baez.—p. 58.
*The Endocrine Glands in Tropical Pathology. L. García de Quevedo.—p. 65.
Appendicitis and Sondern's Line of Resistance. R. del Valle Sárraga.—p. 73.

Laboratory Methods in the Diagnosis of Chronic Tropical Diarrhea.—González Martínez describes the characteristics of the causal micro-organism, the fixation of complement test and its importance and reliability in differential diagnosis, and the brilliant success of vaccine therapy. Few diseases have such a solid basis of established facts, microbiologic, experimental, serologic and therapeutic, which have been accumulated at the Porto Rico Hygiene and Tropical Medicine Institute by González Martínez, C. Michel and B. K. Ashford. The causal micro-organism has been named *Parasaccharomyces ashfordi*.

Endocrine Glands and Tropical Pathology. — García de Quevedo remarks that well defined diseases of endocrine origin, such as Addison's disease, exophthalmic goiter, acromegaly, etc., are rare in Porto Rico. On the other hand, abnormal functioning of endocrine glands is a frequent confusing element in tropical pathology. Giantism is rare in Porto Rico, but dwarf growth is frequent. Among the 17,000 drafted men examined for the World War, very few were over 5 feet 10 inches, and many failed to reach the army minimum of 5 feet 4 inches.

South Carolina Medical Association Journal, Greenville

May, 1922, **18**, No. 5

Symptomatology and Treatment of Certain Types of Chronic Infectious Arthritis. E. S. Cross, Baltimore.—p. 120.
Perirenal Abscess with Case Reports. J. H. Taylor, Columbia, S. C.—p. 128.
Ureteral Obstruction. L. J. Ravenel, Florence, S. C.—p. 134.

Tennessee State Medical Association Journal, Nashville

May, 1922, **15**, No. 1

Value of Necropsies. B. T. Terry, Nashville.—p. 39.

West Virginia Medical Journal, Huntington

April, 1922, **16**, No. 10

Mental Defectives in West Virginia. L. V. Guthrie.—p. 375.
Case of Hemolytic Streptococcus Septicemia with Some Unusual Clinical Manifestations. G. E. W. Hardy, Baltimore.—p. 382.
Syphilis of Central Nervous System. D. A. MacGregor, Wheeling, W. Va.—p. 384.
What Are You Going to Do About It? E. S. Hamilton, Oak Hill, W. Va.—p. 391.
Management of Nephritis. W. A. Jenkins, Louisville, Ky.—p. 395.

Wisconsin Medical Journal, Milwaukee

May, 1922, **20**, No. 12

Symposium on Cancer. P. H. McGovern, C. H. Banting, G. V. I. Brown, J. L. Yates, J. P. McMahon, et al., Milwaukee.—p. 599.
Endocrine Staff Meeting. A. A. Skemp, La Crosse.—p. 621.
Value of Radium in Treatment of Malignant Neoplasms. R. H. Jackson, Madison.—p. 624.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Medical Hydrology, London

May, 1922, No. 1

Scientific Foundations of Hydrotherapeutics. A. Strasser.—p. 16.
Treatment of Circulatory Trouble by Natural Effervescent Baths. R. Wybauw.—p. 22.
How to Study a Mineral Water at the Present Time. A. Chassevant and P. Ferreyrolles.—p. 25.
Modern Spectroscopy as Applied to Study of Natural Waters. S. Judd Lewis.—p. 33.
Physiologic Investigation of Medical Water. W. Bain.—p. 36.
Spas and "Modern Treatment" of Diabetes. G. Monod.—p. 37.

British Medical Journal, London

May 27, 1922, **1**, No. 3204

*Diagnosis of Hysteria. H. Head.—p. 827.
Three Years of Pelvic Surgery. W. E. Fothergill.—p. 830.
Some Common Defects of Diet and Their Pathologic Significance. E. Mellanby.—p. 831.
Interstitial Gland. L. Williams.—p. 833.
Peptone Treatment. A. G. Auld.—p. 835.
Case of Nonrheumatic Aortic Stenosis in Young Subject. W. Gordon.—p. 836.
Observations on Two and Half Years' Antenatal Work. M. E. Weston.—p. 837.
Axis of Astigmatism and Its Location. J. Keyms.—p. 838.
Fracture in Osteitis Deformans. J. A. Smith.—p. 838.
Fracture of Terminal Phalanx of Finger. C. V. Braimbridge.—p. 838.
Hemorrhagic Colitis. L. E. C. Norbury.—p. 839.
Elephantiasis of Labium. R. W. Mendelson.—p. 839.

Diagnosis of Hysteria.—Speaking of the treatment of hysteria, Head says: If possible, the patient should be removed from the usual surroundings and new influences brought to bear. An attempt should be made to switch the dissociated part into the continuity of the patient's mental life. Every form of persuasion should be exercised to convince the patient that he is able to carry out the action he is convinced to be impossible. Never bully him or accuse him of dishonesty. No one is a greater failure than the medical officer who wishes all hysterics could be shot at dawn. On the other hand, the firm diplomatist with subtle and demonstrable reasons why the patient can stand, walk, or feel, often produces miraculous cures. But it must never be forgotten that in a large number of cases, especially in civil life, removal of hysterical symptoms is only a prelude to the discovery of an anxiety neurosis. The causes for the suppressed emotion must be investigated, or the patient may be left in an even worse condition than that in which he was found. Do the patient no harm by antitherapeutic suggestion; carefully prune conversation, and do not think the diagnosis aloud. Avoid such words as "neuritis." Some diagnoses, such as "floating kidney," are more deadly than the disease. Avoid thinking in terms of surgery when dealing with functional neuroses. At the same time the most brilliant conversation is useless with an hysteric.

National Medical Journal of China, Shanghai

March, 1922, **8**, No. 1

*Trachoma in China. T. M. Li.—p. 1.
Present Status of Cancer Problem. J. H. Liu.—p. 11.
Bacteriologic Diagnosis of Cholera. E. T. H. Tsen.—p. 22.
Present Day Dietary Standards. B. E. Read.—p. 35.
*Importance of Adopting a Uniform Medical Nomenclature. C. V. Yui.—p. 43.
Case of Ovarian Cyst. J. W. H. Chun.—p. 45.

Trachoma in China.—Li says that trachoma is undoubtedly the greatest single cause of the economic losses that are occurring in China today, but it is appalling to find that so much apathy exists concerning a disease which has made millions of people blind and several times that many nearly blind.

Uniform Medical Nomenclature in China.—Yui reports briefly on the work done thus far by the Scientific Terminology Association. The association has been working for seven years on terminology with the result that 10,000 terms are fixed. It has the selected terms of old or Japanese translations, and modifications are made if necessary. Yui insists that China should have a medical literature of her own. She cannot indefinitely depend on foreign languages for instruction. Medical science, if taught in Chinese, can permeate the whole of China more quickly and with much greater ease, but only the approved terms should be used; hence the importance of adopting a uniform medical nomenclature.

Glasgow Medical Journal

May, 1922, **97**, No. 5

Laceration of Cervix Involving Lower Uterine Segment and Fornix. R. A. Lennie.—p. 257.
Tay-Sachs' Disease: Symptomatology and Pathology of Three Atypical Cases. H. W. Torrance.—p. 263.
*Herpes and Varicella. W. M. Elliott.—p. 274.
*Unusual Case of Extraperitoneal Abdominal Pregnancy. D. M. Lindsay.—p. 277.

Herpes and Varicella.—Out of nine cases of herpes occurring in wards in charge of Elliott, outbreaks of chickenpox followed in five, all within the acknowledged incubation period of the disease, and in none of the outbreaks was any source discoverable—that is to say, no other cases of chickenpox, either actual or suspicious, had occurred in the ward, and all the patients attacked had been in the ward for a time much over the incubation period. In two of the nine cases there appears to be considerable doubt as to the diagnosis of a septic condition or impetigo. If these two cases are discarded, there emerges the rather striking fact that out of seven occasions on which the patient in a ward developed herpes zoster, unexplainable chickenpox followed in five.

Extraperitoneal Abdominal Pregnancy.—Lindsay cites the case of a woman of 31, who complained of "pains back and front" and stated that her "waters had broken," Dec. 31, 1919. Inquiry revealed that her menstrual periods were regular and painless, and that she had menstruated regularly and normally until June 10, 1919. The breasts were enlarged, the nipples pigmented, and secretion could readily be expressed. The abdomen was prominent, the abdominal muscles somewhat taut, and there was a readily palpable mass of the size and consistence and in the position of a four months' pregnant uterus. Fetal parts or movements were not palpable, and the patient herself had not been conscious of fetal movement. Careful auscultation failed to discover sounds of a fetal heart. Pieces of decidua were passed and fever developed, irregular, but reaching 104 F. February 13 an incision was made in the convex right fornix, releasing a great quantity of foul smelling, brownish, pus streaked fluid. Much green gray membranous débris, fetal skeletal parts, and decomposing fetal soft parts were removed piecemeal with ovum forceps. Calculated from the size of the femora and humeri, Lindsay says the fetus must have been between the fifth and sixth month of intra-uterine life. The pus contained streptococci and coliform bacilli, also a gram-positive bacillus showing terminal spore formation. March 22 a further operation was deemed necessary. The urethra was dilated, and more osseous remains were removed from the bladder. Despite all efforts at stimulation the patient died. There was in this case absence of a history of acute abdominal pain, even of discomfort or of hemorrhage. Lindsay says the formation of the vesical fistula prior to operative intervention seems new.

International Journal of Psycho-Analysis, London and Vienna

March, 1922, **3**, No. 1

Manifestations of Female Castration Complex. K. Abraham.—p. 1.
Pleasure in Sleep and Disturbed Capacity for Sleep. M. J. Eisler.—p. 30.
A Few "Don'ts" for Beginners in Technic of Psycho-Analysis. E. M. Cole.—p. 43.
Symbolism of Appendicitis. W. H. B. Stoddart.—p. 45.
Simple Lapsus Linguae. C. D. Daly.—p. 46.
Unconscious Root of Aesthetic Taste. S. Herbert.—p. 47.
Spermatozoa Phantasy of an Epileptic. F. P. Muller.—p. 50.

Japan Medical World, Tokyo

May 15, 1922, **2**, No. 5

Syphilitic Serum Reactions. K. Taoka.—p. 126.
*Etiology of Beriberi. K. Ohomori, M.D., Y. Ohhashi, H. Nakanichi, M. Hara, and T. Ota.—p. 128.
*Experimental Polished Rice Diseases in Human. K. Taguchi, S. Hiraishi and F. Kwa.—p. 133.

Etiology of Beriberi.—Ohomori and his associates performed experiments which show that beriberi is produced in healthy men when they take food deficient in vitamin B. Thus it is clearly established that beriberi is avitaminosis. Therefore, without changing the diet, it may be cured by supplying vitamin B.

Beriberi and Human Polished Rice Disease.—The beriberi and human polished rice diseases, according to Taguchi et al., are not absolutely the same or identical diseases. But from the clinical side the human polished rice disease cannot be distinguished from beriberi. If polished rice disease can be considered as avitaminosis the human experiments of polished rice disease give a considerable weight to the theory that beriberi is due to lack of vitamin B.

Journal of Neurology and Psychopathology, Bristol

May, 1922, **3**, No. 9

*Causalgia and Allied Painful Conditions Due to Lesions of Peripheral Nerves. H. S. Carter.—p. 1.
Inhibition and Excitation in Central Nervous System. T. G. Brown.—p. 39.
*Psychopathology and Theory of Psychopathic (Germinal) Inheritance. I. D. Suttie.—p. 42.
*Treatment of Spastic Paralysis. R. G. Gordon.—p. 47.
Erythromelalgia, Causalgia and Allied Conditions. S. Kelly.—p. 55.

Etiology of Causalgia.—The fundamental lesion in causalgia and allied conditions, Carter says, is one of intraneural and perineural sclerosis, and the irritation thus set up of fibers at the site of injury to the nerve causes perverted afferent impulses to be sent back to the cord, and possibly further to the subcortical and cortical centers, and thence efferent responses of vasodilator, secretory, and trophic natures are reflected to the peripheral distribution of the nerve, where reaction on the end organs and sensory corpuscles in this area is interpreted as pain. The reason why lesions of this type of the median nerve and internal popliteal fibers produce a true causalgia in some cases, pain of less severity in others, and in the remainder nothing but the discomfort of partial sensory loss, is difficult to answer. It is improbable that inflammatory reaction to different groups of organisms provides a solution. It hardly seems possible that irritation of a special group of fibers is the cause, for causalgia is rare, and it is not within the range of probability that such fibers should be so seldom involved. The most that can be said is that there is some peculiarity in the trauma of the nerve in these few cases, which causes disturbance of those cells in the brain whose function it is to interpret pain. By resection of the irritated and sclerosed portion of nerve, the source of the perverted impulses is removed and the pain vanishes; and by restoring the continuity of the nerve, the path for normal impulses is remade and gradually recovers its conductivity as the nerve regenerates. Details of twenty-four cases are given.

Theory of Psychopathic Inheritance.—Suttie attempts to show that the neuropathologic theory of mental disease is associated with the hypothesis of its hereditary transmission. He thinks even that the two lend each other "moral" as well as logical support. He also indicates that the crucial test of the ultimate validity of psychopathologic interpretation is its ability to account for high familial incidence of the disease-form to which it is applied. To hazard a tentative judgment on these lines, while presuming an agreement on the evidence, it might be said that as certain mental syndromes have no typical or integrated psychic aspect, but have, on the other hand, a demonstrably organic basis, it must be inferred that any hereditary relation is physical, and mutatis mutandis where no neural lesion or abnormality is discoverable. Thus mental defect is heritable; the psychoses are questionably so, with the exception of paranoia, which with the minor and anomalous neuroses are probably acquired.

Treatment of Spastic Paralysis.—In cases of spastic paraplegia muscles are already hypertonic, and further stimulation by electricity or massage, as usually given, will increase their tone and make matters worse. A very important point in the treatment of spastic cases according to Gordon is, by the use of proper splints, to prevent the weaker muscles being stretched and rendered atonic. Contractures are the result of neglecting to apply a light celluloid splint or a leather gaiter. So far as active treatment is concerned, it is essential to attempt to induce relaxation of the hypertonic muscles and encourage the action of their opponents.

Journal of State Medicine, London

May, 1922, **30**, No. 5

Industrial Colonies and Village Settlements for Consumptive. P. C. Varrier-Jones.—p. 185.
Surgical Tuberculosis in Children. C. E. M. Jones.—p. 192.
Clinical Differences in Course of Tuberculosis Seen in Various Age-Groups and Races. S. L. Cummins.—p. 203.
Organization and Conduct of Tuberculosis Dispensary Work. W. H. Dickinson.—p. 208.
Helio-Alpine Treatment of Surgical Tuberculosis. A. J. Morland.—p. 210.

Journal of Tropical Medicine and Hygiene, London

May 1, 1922, **25**, No. 9

Dengue vs. Malaria. R. E. I. Johnson.—p. 111.
*Emetin Treatment for Bilharzia Disease. F. G. Cawston.—p. 112.
Aphiochaeta Xanthina, Speiser (A. Ferruginea, Brun) as an Intestinal Parasite in Gold Coast. A. Ingram.—p. 113.

Emetin in Bilharziasis.—An experience with more than 300 injections of emetin hydrochlorid given to patients whose urine contained the ova of *Schistosoma hematobium*, *S. mansoni*, and ova resembling those of *S. bovis*, Cawston says, shows that when the doses are given skilfully and regulated properly, this method of treating bilharzia disease is free from undesirable toxic effect, and is permanently successful in eradicating the infection. Nevertheless, in view of the difficulty in determining slight cardiac depression due to the large doses required by adults, the emetin treatment should be confined to children and young persons, and careful attention paid to the rate of the pulse throughout. Provided undue exertion is avoided, there is no reason for the patient to be treated as a bed patient, and moderate exercise is useful in determining when the highest dose the patient can comfortably tolerate is reached.

Lancet, London

May 27, 1922, **1**, No. 5152

*Alimentary Toxemia in Nervous Disorders. T. Thompson.—p. 1031.
*Syphilis in General Practice. D'A. Power.—p. 1035.
*Relation of Thyroid to Female Pelvic Organs. C. M. Wilson and A. W. Bourne.—p. 1038.
*Prognosis in Diabetes Mellitus. D. M. Lyon.—p. 1043.
*Case of Subclavian Aneurysm with Cervical Ribs. C. A. Moore.—p. 1045.
Blood Supply of Dentate Nucleus of Cerebellum. J. L. Shellshear.—p. 1045.
*Focal Tenderness in Diagnosis of Gastric Ulcer. G. Vilvandré.—p. 1047.
Association of Failure of Accommodation with Sore-Throat. L. McMillan.—p. 1048.

Alimentary Toxemia in Nervous Disorders.—To prevent the nervous complications of this condition and to avoid infection from the alimentary tract, Thompson states that it is essential first of all to attend to the hygiene of the mouth and associated cavities. Regular daily evacuation of the bowels is essential in the majority of people. The relation of food ingested to alimentary toxemia is very important. The ingestion of large quantities of meat tends to produce excessive fermentation in the intestine. The ingestion of carbohydrates, especially sugar, favors certain forms of intestinal putrefaction. It is probable that diminution of the total bulk of the food is of most value in reducing alimentary toxemia. Most people eat far too much and might with advantage make a very considerable diminution in the total amount of food eaten. The preparation of food is also most important; all salads and uncooked vegetables should be washed carefully and prepared before being eaten. Milk is a potent source of infection of the alimentary tract, and the utmost endeavor should be made to obtain a pure milk sup-

ply. The methods which have been adopted of modifying bacterial contents of the intestine are important. The giving of vaccines prepared from the *Bacillus coli* and streptococcus normally found in the feces is strongly condemned. If abnormal organisms are found in the feces and definite signs of intestinal poisoning are present, giving a vaccine made from such abnormal microbes is occasionally followed by good results. The introduction of lactic acid bacilli into the intestine with a view to diminishing intestinal fermentation has had a long and persistent trial with results not as successful as was at one time hoped. Intestinal disinfectants are certainly of use in many cases.. These may be divided into mercurial preparations, salicylate preparations, and phenol derivatives. Of the mercurial preparations, calomel is the most effective, and is best given in small doses of 1/10 grain. Of the salicylate preparations, sodium salicylate and phenyl salicylate have proved of value. The taking of copious amounts of fluids also seems to have a good effect in cases of alimentary toxemia. Lavage of the large intestine has also been of considerable help.

Syphilis in General Practice. — Power discusses mistakes due to (1) the unlikelihood of infection owing to the social position of the patient or the unusual mode of infection; (2) prolonged latency of symptoms generally in connection with inherited syphilis, as in cases where the patient has no stigmata, has married, and has had healthy children; or, in the acquired disease, where very many years have elapsed since the patient had any signs. Under both conditions increasing age or slight injury appears to be the determining cause of the syphilitic manifestation. (3) The modifying effect of syphilis on other forms of infective inflammation, whether it be tuberculous, phagedenic, streptococcal or staphylococcal. The conclusion arrived at is that syphilis affects a sufficiently large number of the population to make it worth while to bear in mind the possibility of a spirochetal factor in many of the obscure and chronic inflammations which do not respond to the ordinary methods of treatment.

Basal Metabolism in Pregnancy.—Wilson and Bourne point out that the basal metabolic rate is in the majority of pregnant women, but not in all, raised above that normally found in the nonpregnant woman. The basal metabolic rate of different pregnant women at corresponding periods of gestation varies considerably, but they have not found it possible to trace any relation between these variations in the rate and the clinical condition of the mother. In some patients, probably the majority, the rise in the basal metabolic rate disappears after delivery, but in a certain number of cases the high rate of pregnancy does not subside after the puerperium, but abnormally persists. The suggestion is put forward that in some of the latter cases the excessive thyroid secretion gives rise to a menorrhagia without pelvic signs. Additional evidence that a high basal metabolic rate is associated with certain forms of menorrhagia is furnished by a group of cases to which the label functional menorrhagia is attached, to draw attention to the absence of any demonstrable pelvic abnormality. The cases comprising this group are resistant to all ordinary medicinal and operative measures, but respond readily when the thyroid gland is exposed to roentgen rays. The disappearance of pelvic symptoms is coincident with a fall to the normal of the basal metabolic rate.

Prognosis in Diabetes Mellitus.—Before treatment is begun a valuable index of the gravity of the disease, Lyon states, is the degree and rapidity of body-wasting that has taken place. For practical purposes the best guide to the severity of the condition is the total amount of glucose lost each day in the urine, but this sign, like nearly all others, fails to distinguish between temporary and permanent damage. Laboratory tests show that in cases of diabetes a degree of hyperglycemia may still be present even when sugar no longer appears in the urine. Mere estimations of the gravity of the disease when the patient is first seen give no sure guide to the future, since some cases, apparently severe, do much better than others whose signs are less marked. It is therefore recommended that no definite prognosis be given until the character of the patient's response to treatment has been studied.

Subclavian Aneurysm with Cervical Rib. — The aneurysm in Moore's case sprang from the front of the artery and not from the part in contact with the rib. The presence of a normal radial pulse seemed to indicate that there was no compression of the artery. It turned out to be a saccular diverticulum of the size of a cherry, springing from the front of the third part of the artery—itself apparently normal in other respects. The wall was thin and the sac could be emptied by compressing it. A kangaroo-tendon ligature was placed on either side of the sac. The operation was straightforward throughout and almost bloodless. Next day the arm was normal, except for absence of the radial pulse. The circulation differed in no other respect from that of the opposite side and all movements were unimpaired. There was a little surgical emphysema of the right chest and face, but none of the left side, and no clinical signs of pneumothorax. Recovery was uneventful. The radial pulse began to reappear on the fourth day, and the aneurysm could be felt, but no longer seen, as a firm nonpulsating mass.

Focal Tenderness in Gastric Ulcer.—By palpating with one finger along the whole of the lesser curvature, from a point nearly as high as the cardia, starting from the infrachondral margin down as far as the pylorus, a test is applied in the roentgen-ray diagnosis of gastric ulcer which, in Vilvandré's experience, is of great value. He terms it focal tenderness. Palpation similarly applied along other points of the small curvature elicits no response. The more intelligent the patient, the more rapid and definite the response.

Archives des Maladies de l'App. Digestif, Paris

May, 1922, **12**, No. 3

*Diverticulum of Esophagus. R. Bensaude, R. Grégoire and G. Guénaux. —p. 145.
*Tests for Occult Hemorrhage. L. Pron.—p. 204.

Diverticulum of Esophagus.—This profusely illustrated study of diverticuli at the entrance to the esophagus is based on six operative cases. While the diverticulum is forming, some slight disturbance in swallowing is usually noted, and signs of irritation in the pharynx, a tickling and dryness, profuse flow of saliva, the hawking up of thick mucus, frequent spasmodic coughing, and the sensation of a foreign body arrested in the throat. Nearly all these diverticulum patients had been long taking treatment for the throat, without the least benefit. In a few, the onset of disturbance was sudden, after some trauma to the throat. Radioscopy shows the recess, its filling up from above, the smooth oval outline, and the way in which it follows the movements of swallowing. He prefers to draw the tip of the diverticulum up into the incision, made at the point of greatest protrusion, and resect with the thermocautery, between two clamps, suturing at once. In 109 cases, with all the operative treatment at one sitting, there were twelve deaths; in three there had been septic cellulitis. Suppuration occurred in twenty-three cases but these complications are growing constantly rarer. The esophagus gives a solid suture, and fluid food can be allowed the fourth or fifth day or even earlier. Gross allowed it the next day; Jacobs the second day, and Taylor the fourth.

Test for Occult Hemorrhage in the Digestive Tract.—Pron concludes from his comparative tests of thirteen different methods that only the Boas chloral-alcohol-guaiac method and the modified Adler method are reliable and sufficiently sensitive. The Snapper spectroscopic test is sensitive and specific, but is only a laboratory method. Boas' test is made with 2 c.c. of a 70 per cent. alcoholic solution of chloral, plus 10 drops of acetic acid, the whole agitated several times and allowed to stand for five minutes. The mixture is then poured into a dry glass containing a pinch of freshly and finely pulverized guaiac resin. To this is added 20 drops of 3 per cent. hydrogen peroxid or a pinch of barium peroxid. The modified Adler method is to add a pinch of benzidin to a few cubic centimeters of acetic acid, without heating, and then add the hydrogen peroxid. By thus preparing the benzidin solution fresh each time, and diluting well, the reaction is reliable.

Archives des Maladies du Cœur, Etc., Paris

April, 1922, **15**, No. 4

*Composition of Human Blood. V. Bie and P. Möller.—p. 177.
Action of Quinidin in Auricular Fibrillation. R. Wybauw.—p. 206.
Basophil Granulocytes in Effusions. J. Sabrazès.—p. 214.

Composition of Human Blood.—Among the data compiled by Bie and Möller from their research on ten men and ten women is the finding that there is approximately 2 per cent. more ash in the blood of men than of women. The average number of red corpuscles in normal men ranged from 4,750,000 to 6,333,000, with the extreme limit at 6,500,000. In normal women the range was from 4,000,000 to 4,250,000 and up to 5,250,000, and extreme limit, 5,500,000. Men's blood can absorb more oxygen than women's blood. This is evidently due to the larger proportion of corpuscles.

Archives de Médecine des Enfants, Paris

May, 1922, **25**, No. 5

*Ascites from Inherited Syphilis. M. Acuña and A. Casaubon.—p. 257.
Influenza a Pneumonia. Suzuki.—p. 268. Conc'n. Abst. **78**: 1996.
Mongolian Blue Spot. E. Apert.—p. 295.
Pediatrics in Poland. J. Comby.—p. 297.

Chronic Peritonitis with Effusion in Inherited Syphilis.—In this communication from Buenos Aires, a case of ascites is described which forms the third on record of chronic peritonitis for which inherited syphilis was evidently responsible. The great improvement in all these cases under specific treatment for syphilis confirmed the nature of the ascites. The absence of fever and lack of pain and tenderness, with the various signs of inherited syphilis, differentiated the cases, especially as inoculation of guinea-pigs showed no signs of tuberculosis.

Bulletin de l'Académie de Médecine, Paris

May 23, 1922, **87**, No. 21

*Paratyphoid Cholecystitis. P. Menetrier et al.—p. 559.
*History of Law of Crossed Paralysis. Klippel.—p. 562.
Anatomy of Auriculoventricular Bundle. O. Josué.—p. 564.

Paratyphoid Cholecystitis.—The acute cholecystitis had developed in the man of 58 the tenth hour after eating some canned tongue which had seemed suspicious at the time. The paratyphoid A bacillus was agglutinated and was cultivated from the blood. The man had recovered in twenty-five days. A latent cholelithiasis had evidently helped to localize the toxi-infection in the gallbladder. He was a waiter, and one other waiter, who had eaten some of the tongue, died within forty-eight hours.

Law of Crossed Paralysis.—Klippel traces back through Morgagni, Valsalva and Boerhaave to Aretæus the practice of venesection on the sound side in case of unilateral apoplexy. Aretæus' exact period is not known but is ascribed to the first century of our era.

Journal de Radiologie, Paris

April, 1922, **6**, No. 4

Simplified Technic for Recording Chronaxia. H. Guilleminot.—p. 157.
*Electricity in Exophthalmic Goiter. M. Ménard and F. Foubert.—p. 162.
Present Uses of Deep Radiotherapy. Nadaud.—p. 171.
Deep Radiotherapy of Tonsil Sarcoma. Canuyt and Gunsett.—p. 181.
Diaphragmatic Hernia. V. Nalli and J. de Beaujeu.—p. 184.

Continuous Current in Treatment of Exophthalmic Goiter.—Ménard and Foubert compared the effects of radiotherapy and galvanization in the treatment of exophthalmic goiter; 17 patients were treated by galvanization and 10 by radiotherapy. Certain cases refractory to galvanization were improved or cured by radiotherapy, and vice versa; 57 patients were treated by the two methods, and the number of failures was considerably reduced. Galvanization is an ideally harmless treatment, but this absolute harmlessness, they say, does not prevent its positive efficacy, as results show. The similarity of the disturbances from exophthalmic goiter with those from pluriglandular and sympathetic derangement, suggested extending the action of the galvanic current to the sympathetic and endocrine systems. This abdomen-thyroid-spine galvanization treatment seemed to act on all the manifestations of the disease and subjective symptoms. In mild forms the symptoms rapidly subsided, but they advise to continue the sittings for three months.

Paris Médical

June 3, 1922, **12**, No. 22

*Infectious Diseases in 1922. Dopter.—p. 453.
*Antityphoid Vaccination by the Mouth. Besredka.—p. 460.
Infectious Diseases in Russia in Recent Years. Dopter.—p. 463.
*Intestinal Spirochetosis in Dysentery. V. de Lavergne.—p. 467.
*Fatal Mumps. Reverchon, Worms and Delater.—p. 471.
*Treatment of Influenza. D. Simici.—p. 474.
Disease in Celluloid Workers. Heim, Agasse-Lafont and Feil.—p. 477.

Infectious Diseases in 1922.—Dopter says that great progress has been realized, since his last annual review, by the practical application of some of the lessons learned in the World War. Epidemic encephalitis seems to be losing its epidemic character. Levaditi's finding of the virus on the epithelial cells in the saliva suggests that it may be a parasite of these elements. Further progress is the apparent identity of the virus of herpes of the cornea and lips with the virus of epidemic encephalitis; the only difference to be detected in rabbits was the lesser degree of virulence. Levaditi's research also sustains the assumption of healthy carriers. The virus may have an affinity for the epithelial cells but may acquire periodically an affinity for the central nervous system—the difference seems to be only in the degree of virulence of this *ultravirus encephalitogène*. When it acquires the affinity for nerve tissue, then we have an epidemic of encephalitis. Others dispute these conclusions, saying that the virus of herpes does not induce immunity for encephalitis and vice versa. In treatment of the complications of gonorrhea, intra-articular injection of gonococcus antiserum has proved far more effectual than the subcutaneous route. Sacquépée recently reported a case of gonococcus septicemia persisting for months until cured by four intravenous injections of the specific serum.

Typhoid and Paratyphoid Vaccine by the Mouth.—Besredka emphasizes the importance of following in vaccination the route taken by the infection in its invasion. This is the reason why guinea-pigs can be successfully vaccinated against anthrax by introducing the vaccine directly into the skin, while intraperitoneal vaccination is always disastrous. With dysentery, typhoid and cholera, the mouth is the route of invasion, and vaccination should be by the mouth likewise. An experiment in this line has just been made on a large scale in northern France by Vaillant, in a region where typhoid is endemic. The populace were persuaded to take a pill of bile and a tablet containing a mixture of heat-killed typhoid and paratyphoid bacilli, before breakfast, on three successive mornings; children under 7 took it for only two mornings. A total of 1,236 of the inhabitants were thus vaccinated out of a total of 2,000. Among the unvaccinated 7.7 per cent. contracted typhoid and 2.3 per cent. of the 173 who had been vaccinated by the subcutaneous route. Of the 1,236 who had taken the *vaccin bilié* by the mouth, only 0.17 per cent. developed the disease. The results were thus highly encouraging; there were no by-effects except slight colic and headache in a few cases, never enough to interfere with business or appetite. The resulting immunization is at least equal to that realized by the subcutaneous route. This immunization being strictly local, that is, intestinal, does not require the cooperation of any other organ. Hence a lesion in the kidneys, liver, lungs or elsewhere does not interfere with this form of vaccination although it might contraindicate subcutaneous vaccination.

Intestinal Spirochetosis with Dysentery.—The symbiosis of fusiform bacilli and spirochetes which is found in Vincent's angina has been discovered in the rectum and colon in cases of dysentery and explains many puzzling pathologic conditions.

Pathologic Anatomy of Mumps.—This article was reviewed in the Paris Letter.

Treatment of Influenza.—Simici writes from Bucharest to call attention to the encouraging results he has realized in treatment of influenza by subcutaneous injection of convalescents' blood.

Presse Médicale, Paris

May 10, 1922, **30**, No. 37

Intramuscular Treatment of Syphilis. E. Jeanselme et al.—p. 397.
Radioactivity of Mineral Waters. Castelnau and Loisel.—p. 399.
*The Barranikow-Döhle Corpuscles. H. Accoyer.—p. 401.

The Barranikow-Döhle Bodies in the Leukocytes.—Accoyer reports on these bodies in 5 cases of scarlet fever, in 2 of measles, 3 of erysipelas, 3 of tonsillitis, 5 of diphtheria and one each of malaria, mumps and typhoid, besides a number of other cases after defervescence and late into convalescence. These inclusions were most numerous the more pathologic the condition, regardless of the nature of the infection. He compares the theories in regard to their origin.

May 13, 1922, **30**, No. 38

*Intrathoracic Operations. P. Duval.—p. 409.
Calcium Salts in Asystolia. D. Danielopolu et al.—p. 413.

Unilateral Intrathoracic Operations.—Duval insists that unilateral surgical pneumothorax is harmless. In dogs, there is an open communication between the pleurae, and hence pneumothorax on one side spreads at once to the other side, so both lungs have to collapse. But even in dogs, if the opening into the thorax is closed, the dyspnea subsides, and the dog survives. The pleurae do not communicate in man or in the rabbit and calf. The pneumothorax on one side did not spread to the other side in his experiments on rabbits and calves. Hence, he says, Graham's conclusions from research on dogs are erroneous: they do not apply to man. With surgical pneumothorax, the lung collapses completely and there is no respiration; the air is quiet, not flowing in and out, and the pneumothorax causes no disturbance. All the various measures applied to relieve dyspnea with pneumothorax aim merely to arrest this inflow and outflow of air. The most effectual is to close the opening in the chest wall, and thus put an end to the pleural ventilation, or else to make the opening still larger and thus insure the total collapse of the lung. In two cases the dyspnea subsided when he made the opening larger, and pressed down on the lung with hot compresses to expel all the residual air. Differential pressure procedures, etc., are superfluous; all that is needed is to make the opening into the chest large, and immobilize the walls with a retractor which stretches that side of the diaphragm, making sure that all the residual air is squeezed out of the collapsed lung. The surgeons can then operate with confidence that there will be no modification of the heart or respiration rhythm, the collapsed lung safely tucked out of the way. He makes a point of aspirating out all the air in the pleura the last thing before completing the suture. The roentgenologist watches as this is being cautiously done, and notifies the surgeon the moment the entire lung expands to reach the chest wall. The results have been most gratifying in his experience with over 100 intrathoracic operations of the kind, many of them for extensive war wounds. All recovered but one man who was suffocated by pus, and another with cancer of the esophagus.

May 17, 1922, **30**, No. 39

*Treatment of Syphilis. L. Brocq.—p. 421.

Treatment of Syphilis.—Brocq declares that the general practitioner is confused by the conflicting opinions that prevail among syphilologists. There is no agreement as to the drug, the dose, the method, etc., and it is still a question whether the intravenous treatment may not damage the vessels and the liver seriously. He regards it as extremely significant that, whereas in the nine years before 1905 he never observed more than three or four cases of jaundice in syphilitics, in recent years jaundice is being constantly encountered in syphilitics that have been treated with arsenicals. In any event, he says, these drugs should not be given further to patients developing jaundice under them.

May 20, 1922, **30**, No. 40

*Radiotherapy of Pituitary Tumors. F. Terrien.—p. 429.
Intravenous Quinin Treatment of Malaria. Genevrier.—p. 431.
*Cardiac Thrombostasis. R. Lutembacher.—p. 432.
*The Anilin Dyes in Surgery. L. Cheinisse.—p. 435.

Radiotherapy of Pituitary Tumors.—A combination of organotherapy, mercurial treatment and the roentgen rays has given excellent results in nearly all the cases of pituitary tumors in which it has been tried. Terrien adds that the effect was particularly striking on the trophic disturbances from the tumor, and above all on the headache and impairment of vision. In 148 cases of pituitary tumor with visual disturbances on record, there was blindness in 34, but choked disk only in 15. In 10 cases treated with radiotherapy the improvement in the visual field is evident from the charts given, as also in Carlotti's 4 cases. In some of these cases vision was regained after several months of blindness. Béclère irradiates the pituitary through mouth, brow and temples, where the bone is thinnest, using 5 H. units at each sitting. In all his cases the action was durable. One patient has had no recurrence during nine years to date. In one of the cases the radiotherapy seemed to reduce the visual field, hence extreme caution is necessary. The effect is most pronounced with disturbances of mechanical origin.

Cardiac Thrombostasis.—Lutembacher describes the clinical picture induced by thrombi in the heart, too large to pass into the vessels. Even at necropsy the cause of the sudden death may not be suspected unless the heart is opened up.

The Anilin Dyes in Surgery.—Cheinisse concludes his review of recent literature on this subject with the statement that the anilin dyes seem to act only on staphylococci and streptococci.

May 24, 1922, **30**, No. 41

*Effect of Liver Extract on Heart and Vessels. H. Roger.—p. 441.
*Electric Destruction of Pleural Adhesions. M. Herve.—p. 446.
*The Babinski Toe Phenomenon. Z. Bychowski.—p. 447.

Action of Organ Extracts on Heart and Vessels.—In his systematic research on extracts of various organs, Roger tries to isolate the special substances and the antagonists. He discusses liver extract here, reproducing eleven tracings to show the cardiovascular effect.

Electric Destruction of Pleural Adhesions.—Herve describes in detail a case in which he succeeded in breaking up adhesions with the high frequency current, thus rendering artificial pneumothorax possible by this *étincelage*. It did not cause pain or hemorrhage, and the benefit from compression of the lung was prompt and pronounced.

The Babinski Toe Phenomenon.—Bychowski recalls that this year has been the twenty-fifth anniversary of Babinski's toe sign. "The chapter thus inaugurated by Babinski is by no means concluded." Bychowsky comments on the negative toe sign in his 100 cases of motor disturbances from epidemic encephalitis, and after certain war wounds of the brain.

May 27, 1922, **30**, No. 42

*Septicemic Adenopathies. P. Ravaut, Boulin and Rabeau.—p. 453.
*Recent Research on Measles. P. L. Marie.—p. 456.

Septicemic Lymphadenitis.—Ravaut and his co-workers discuss a variety of benign suppurative *poradéno-lymphite* with septicemia, and its relations with subacute inguinal lymphogranulomatosis.

Prophylaxis of Measles.—Marie reiterates that, next to tuberculosis, measles is the most murderous of all diseases of children, and yet not until 1916 was any attempt made to utilize convalescents' serum in prophylaxis. This was done by Nicolle and Conseil at Tunis, protecting the younger children in a family by injecting 4 c.c. of blood serum from the convalescent older child. Their further experiences were published in 1918, and were confirmed by Richardson and Connor in 1919 and by others in South America and Germany, by Degkwitz in particular, whose first publications date from 1920. Degkwitz has since published successful prophylaxis by a vaccine made from the eye and throat secretions of cases of measles. This induces a mild febrile reaction, and none of those thus treated has contracted measles during the months since.

May 31, 1922, **30**, No. 43

*Baldness in the Twenties. R. Sabouraud.—p. 465.
*Silent Cavities in Lungs. R. Burnand and R. Carrard.—p. 467.

Baldness in the Twenties.—Sabouraud remarks that many insects and birds, at the age corresponding to the twenties in men, develop some ornamental feature, a nuptial robe, while

man may lose his hair at this time and thus be deprived of part of his comeliness. "This is illogical and unnatural, and the reason for it is a mystery that will probably baffle several generations yet." No treatment of seborrhea and of seborrheic alopecia has given any appreciable results to date. Local measures may retard the baldness but they never cure. A down may grow and encourage the patient, but the hairs are atrophic and do not last. The best local treatment of these grave seborrheas is carbon sulphid, in spite of the drawbacks of its odor, its inflammability and the smarting it induces. It is the only treatment, he says, which in a few weeks seems to arrest this premature baldness of young men and the seborrhea directly responsible for it. His formula is 75 c.c. of acetone, xylene or benzin; 75 c.c. of carbon tetrachlorid; 150 c.c. of carbon disulphid and 9 gm. of precipitated washed sulphur. He suggests the possibility of organotherapy with an extract of the interstitial gland, which seems to have under its control the secondary sexual characteristics. But no one has tried it as yet, and we cannot experiment on animals, as seborrheic alopecia is unknown outside of the human species. When the baldness seems to follow an illness, the typhoid or other infection has merely hastened the course of the already established alopecia. It begins with the genital period, and castration prevents it. No tendency to baldness was found in 340 eunuchs examined by his correspondents in Asia. In seborrheic alopecia new hairs sprout as soon as the old fall, but each new crop is weaker and smaller, to final total atrophy. Unless a family tendency is known, the young men do not apply for treatment until two, five, ten years too late. The earlier the seborrheic alopecia begins, the more rapid and severe the course. He knows of two brothers who were both bald at 18. When it begins at 16 or 17, it is established at 24, but when it does not begin till 18, the baldness is not complete till 27 or 28. The satyrs on the Greek vases were always young and bald.

Silent Tuberculous Cavities.—Burnand remarks that tuberculous cavities not inducing appreciable symptoms are nothing new, but he has been amazed to find that 55 per cent. of the tuberculous cavities shown up by the roentgen rays had not induced characteristic symptoms. In forty-two cases the only possible suggestion of a cavity was what he calls the *obscurité respiratoire d'un territoire trouble.* In twenty-three others the physical findings indicated merely a focus of softening of the second degree.

June 3, 1922, **30**, No. 44

Action of Garlic on Heart and Vessels. Loeper et al.—p. 473.
*Silent Intracranial Abscess. H. Aboulker.—p. 474.
Cirrhosis of Spleen and Liver of Malarial Origin. D. Ionesco and M. Popper.—p. 477.
Treatment of Sequels of Epidemic Encephalitis. Cheinisse.—p. 478.

Silent Intracranial Abscess.—Aboulker reports from Alger ten typical cases of intracranial abscess from his more extensive experience. In three cases with a very large extradural abscess, and in four cases in which the abscess was in the brain, choked disk was never found, and there was no pain on pressure or percussion, and no motor or sensory disturbances. Headache, with change of character and sluggishness in the mental processes is constant and early with an abscess of the brain. It should be sought and evacuated during this stage, which is a long one, before somnolency and deadening of all faculties follow. He ascribes two of his fatalities to the chloroform, and urges that chloroform should be proscribed when any complication in brain or meninges is suspected.

Schweizerische medizinische Wochenschrift, Basel

May 11, 1922, **52**, No. 19

*Neuritis. O. Veraguth.—p. 445.
*Strophanthin by the Vein. H. Staub.—p. 447.
*Fat Embolism of the Brain. J. Tobler.—p. 452.
Testing Vision. I. Strebel.—p. 456.
*Substitute for Dührssen's Tampon. E. Schreiber.—p. 458.

Notes of a Neurologist.—Veraguth describes a case of polyneuritis with both tonic and paretic features, but without incapacitating the man of 40, a Cook's guide. In another case a Korsakow psychosis followed an attack of botulism poisoning in a woman with pronounced polyneuritis. In another woman, polyneuritis had developed after two operations for recurring mammary cancer. The polyneuritis included the fifth, sixth and twelfth cranial nerves. In another case, carbon monoxid poisoning had induced the polyneuritis. The carbon monoxid had developed from a pile of phonograph records evidently set on fire by the drowsy man's cigar. When he regained consciousness, twenty-four hours later, he was lying on the floor, his legs paralyzed and also the right facial nerve and shoulder muscles, and he and the room were covered with soot. The polyneuritis was intensely painful for six months but it then subsided. The case raises anew the old question whether carbon monoxid polyneuritis is of toxic or mechanical origin, from lying so many hours in a cramped position unconscious. The gradually increasing paralysis of arms and legs in another man was traced to occupational use of "solvent naphtha" in automobiles.

Strophanthin.—Staub gives tracings from a case of severe cardiac asthma kept under control with strophanthin for the two years the man of 52 was under observation. The intervals were finally increased to ten or twelve days, and he was able to resume his work as a shoemaker. Staub warns that strophanthin has a cumulative action, though not so pronounced as digitalis, and only half the dose should be given if digitalis has been taken in the preceding two days.

Fat Embolism of Brain.—Tobler operated in the case described to relieve the pressure on the brain from unknown cause, the fat embolism not having been suspected. The man's leg had been fractured; he became unconscious after the fracture had been dressed. This free interval before the stupor is instructive. The urine and sputum may show fat droplets, but they may be found even without signs of fat embolism. Numerous symmetrical punctiform hemorrhages in the skin are characteristic; they appeared from the third day on in six cases on record. Headache, trismus and spasms of the limbs have been observed, as also isolated paralysis, vomiting, arrhythmia and fever, but are not pathognomonic. The fat embolism in this case was not suspected until necropsy, when the peculiar purpura aspect of the brain first suggested it.

Aluminum Acetate to Arrest Hemorrhage.—Schreiber relates that this drug has never failed in his twenty-five years of practice to arrest hemorrhage from inertia of the uterus at childbirth, and has proved its usefulness in many cases of parenchymatous hemorrhage of various organs. He uses it in a 2 or 3 per cent. solution to arrest obstetric hemorrhages, diluting the officinal 10 per cent. solution, which keeps indefinitely. The hemorrhage after tonsillectomy was always arrested at once by rinsing out the nasopharynx with the 10 per cent. solution.

Pediatria, Naples

April 1, 1922, **30**, No. 7

*Bacteriologic Research on Malta Fever. E. Gerbasi.—p. 289.
*Whooping Cough in the New-Born. G. Milio.—p. 297.
*Tumor in Rhinopharynx. D. Tanturri.—p. 302.
*Urticaria and Ascaridiasis. O. Pentagna.—p. 308.

Bacteriology of Malta Fever.—Gerbasi discusses the biologic and morphologic behavior of the Bruce micrococcus and others resembling it.

Whooping Cough in the New-Born.—Milio relates that the disease was severe in the two infants, 8 and 10 days old, but he tided both safely past the gravest period by an intramuscular injection of 5 c.c. of ether every second day. The paroxysms grew gradually less severe and less frequent. He gave a total of six and eight injections. No benefit was apparent until after the third injection, but then progressive improvement was manifest.

Tumor in Nasopharynx of Small Child.—Tanturri reports another case of successful extirpation of a tumor in the nasopharynx. The cautery loop in a protecting catheter was introduced through the nose (after cocain and epinephrin). It was fitted over the base of the neoplasm, the latter having been loosened up with the fingers. The electric current was then turned on for electrolysis of the base of the tumor. As the mass forming the tumor dropped off, it was seized with

forceps and extracted through the mouth. There was no hemorrhage, and there has been no recurrence during the nearly four years to date. He has operated in this way in a number of other children, and all with similar success. The tumor in this case was a cystic fibroma showing sarcomatous degeneration.

Ascaridiasis and Urticaria.—The disappearance of the urticaria after a vermifuge apparently explained it as a manifestation of anaphylaxis from the ascaridiasis.

May 15, 1922, **30**, No. 10

*Treatment of Tuberculous Meningitis. O. Cozzolino.—p. 433.
Chloroma in Child of 3. G. Caronia.—p. 439.
*Influence of Protein Therapy on Phagocytosis. A. Dominici.—p. 446.

Treatment of Tuberculous Meningitis.—Cozzolino has been giving a trial to Bier's method of passive hyperemia in treatment of tuberculous meningitis in three children 4, 7 and 8 years old. He was inspired to do this by the report of two cases cured by this means, plus lumbar puncture, published in the *Münchener medizinische Wochenschrift* in 1913, p. 1430. No benefit was apparent in Cozzolino's cases, nor in Squarti's eight cases (1916).

Influence on Phagocytosis of Protein Therapy.—Dominici reports considerable research on guinea-pigs which demonstrated that phagocytosis was remarkably stimulated and the inoculated bacteria rapidly disappeared from the peritoneal effusion under the influence of parenteral injection of a protein, either whole milk or peptone or a vaccine. The similar effect induced by all these different proteins—the striking activation of phagocytosis that follows at once the parenteral injection of a small amount—suggests a uniform mechanism. A large dose has a paralyzing effect. She noted a specific action in addition from antityphoid vaccine, after inoculation with typhoid bacilli. Even twice the lethal dose was thus conquered. In experiments with the other proteins, the bacteria injected were always below the lethal dose.

Policlinico, Rome

May 1, 1922, **29**, No. 18

Pleuritis Inducing Asthma. U. Baccarani.—p. 569.
Nervous Symptoms from Malaria in Children. G. Squarti.—p. 571.
Examination of the Prostate. E. Pirondini.—p. 577.
Autolymph Treatment in Tuberculosis. L. Bottacin and D. Magro.—p. 579.
The Probe Needle. V. Bilotta.—p. 580.
Activated Sludge in Treatment of Sewage. A. Filippini.—p. 581.

May 8, 1922, **29**, No. 19

Protein Therapy in Theory and Practice. S. Belfanti.—p. 601. Conc'n No. 20.
Fracture of Patella. G. Tessier.—p. 609.
*Postencephalitis Parkinsonism. B. Masci.—p. 613.
Improvised Dark-Field Microscopy. V. Vanni.—p. 614.
Choice of Occupation. G. Casuccio.—p. 615.

Postencephalitic Parkinsonism.—Masci has been much impressed with the fact that persons with pronounced parkinsonian symptoms after epidemic encephalitis throw them all off when they run. Even one patient with hemiplegia seemed to cast it off like a garment when running. All these post-encephalitis cases displayed this remarkable difference between their halting, jerking, slow movements and their agile running gait. Tilney calls this "metadromic progression," Souques, "paradoxic kinesia," and Masci calls attention to it as a means of distinguishing between true parkinsonism and that which follows epidemic encephalitis. There is nothing of the kind with true parkinsonism.

Riforma Medica, Naples

April 10, 1922, **38**, No. 15

Appendicectomy; Three Cases. S. Scigliano.—p. 337.
*Reflex Action Between Stomach and Ear. A. Roccavilla.—p. 340.
Possible Hormone Action of Ciliary Epithelium. Scalinci.—p. 345.
Vascular Symptoms as Index of Pressure. A. Ferrannini.—p. 347.

Reflex Action Between Stomach and Ear.—Roccavilla applied stimuli of different kinds to the stomach in health and disease, and noted a reflex action in the labyrinth of the ear. It was not as constant nor as lively as the reflex action induced in the stomach, on the other hand, by stimuli applied to the labyrinth.

May 8, 1922, **38**, No. 19

Value and Limitations of Deep Radiotherapy. M. Ponzio.—p. 433.
*Total Amount of Blood. G. Moscati and G. Napolitano.—p. 435.
*Epidemic Lymphadenitis. V. Vanni.—p. 438.
*Malformations in Sexual Perverts. M. Carrara.—p. 440.
Pathology of the Patella. E. Aievoli.—p. 443.

Optic Test for Total Amount of Blood.—Moscati determines the polarizing action of the blood before and five minutes after injection into the blood stream of a given solution of glucose. His experiments in this line on dogs with experimental nephritis confirmed the assumption that there is actually a permanent hydremic plethora, from an increase in the total amount of the blood, and especially of the plasma, in experimental nephritis with much albuminuria.

Epidemic Lymphadenitis.—Vanni was sent to a remote part of the province of Rome to study an epidemic illness which began with sudden pain in one inguinal region followed by torpid ulceration of the local glands, each ulcerating separately. Fever was slight and irregular, and the whole healed in from four to six months, the ulcerations leaving pits. It was highly contagious, and affected both sexes and all ages. A minute micrococcus was shown up by the Ziehl and Giemsa stains in the puncture fluid from the glands. Guinea-pigs injected with this fluid or with cultures of the micrococcus mostly died in a few days, and the liver, kidneys and suprarenals were found much enlarged, the spleen very small.

Local Malformations in Sexual Perverts.—Carrara is director of the Istituto di Medicina Legale at Turin. He writes to protest against the traditional assumption that, because a person is suspected of being a sexual pervert, any abnormal conditions found in the sexual organs or anus are necessarily the result of "sexual delinquency." He declares, on the contrary, that the abnormal conditions may have been primary, and they may have been a factor in the sexual psychopathy. His text is a recent medicolegal case in which a daughter accused her father—a man prominent in social and business life—of incest rape, and presented a medical certificate to the effect that the vagina and anus were so large and smooth that they proved multiple sexual relations. The physician who signed the certificate confirmed it in the witness stand, and the court was more than disposed to accept his view.

Rivista Critica di Clinica Medica, Florence

March 25, 1922, **23**, No. 9

*Spinal Fluid in Neurosyphilis. A. Terzani.—p. 97. Conc'n No. 10, p. 109.

The Spinal Fluid in Disease of the Nervous System.—Terzani describes and criticizes the various reactions that can be induced in the cerebrospinal fluid with disease of the nervous system, especially in neurosyphilis. He gives an instructive table of the findings with eleven different parallel tests in 36 cases, including 3 of tabes and 3 of general paresis. He regards Boveri's simple test as very useful. Although it is not specific for any special disease, yet it warns of the presence of an organic lesion, and often this is all that we need to know for management of the case. He pours along the wall of a test tube containing 1 c.c. of the cerebrospinal fluid, 0.1 c.c. of a 1:1,000 solution of potassium permanganate (not 1 c.c. as often published). A yellow zone forms at the junction of the two fluids, or spreads through the whole if they are mixed. The intensity of the reaction is indicated by the promptness with which the tint changes; from two to six minutes is the accepted range for a positive response. In his series the strongest reaction was obtained with epidemic and tuberculous meningitis (half a minute to two minutes); in general paresis (one to three minutes); in acute poliomyelitis (three to four), and epilepsy (four minutes). The differential count of the cells in the sediment is also important. In one of the cases of tabes the Boveri reaction was pronounced although the Wassermann was negative.

Revista de Medicina Legal de Cuba, Havana

April, 1922, **1**, No. 4

*Lesions from Medicolegal Point of View. A. Barreras y Fernández.—p. 14.
Medical Officers. R. de Castro y Bachiller.—p. 40.

Lesions from Medicolegal Point of View.—Barreras emphasizes that the prognosis from the medicolegal standpoint is different from that of the pathologist. The length of the resulting disability, the physical defect left, and the deformity—all have their bearing on the medicolegal estimation of the case, as he shows by his classification and examples. The definition of deformity or disfigurement, its degree, etc., and the age and sex of the injured, the motive, etc., all have to be taken into account, as he explains.

Semana Médica, Buenos Aires

April 13, 1922, **1,** No. 15

*Pregnancy in Heart Disease. Chamorro, Folco and Dacharry.—p. 577.
*Fever with Hemoptysis in Tuberculosis. F. Gorriti.—p. 580.
Prostatic Adenoma. S. Barabino Amadeo.—p. 581.
Defence Against Tuberculosis. Hitce and Barrionuevo.—p. 595.
Intravenous Treatment of Typhoid Septicemia. de Quiros.—p. 601.
Perversion of Sensuality. L. Sirlin.—p. 606.
Melanic Epithelioma of the Conjunctiva. C. Jiménez Lopez, V. Ribón and A. Peña Chavarría.—p. 609.

Pregnancy in Heart Disease.—The young woman reached term without grave disturbance from the congenital mitral stenosis which before the pregnancy had always been well compensated. Labor brought severe asystolia, arrhythmia and cyanosis. After fourteen hours of ineffectual labor, under spinal anesthesia the cervix was dilated with the fingers, the perineum incised as the head presented, while pressure was applied to the abdomen, and the child was extracted with forceps. The patient was kept in a semiseated position as much of the time as possible. Compensation was soon restored under tonics, restriction to milk, and cupping. The child is developing normally.

Fever with Hemoptysis.—Gorriti has noticed at the national sanatorium for the tuberculous in his charge that hemoptysis sometimes occurs in several of the patients at once during the same day or week. This collective appearance of hemoptysis always coincided with a low barometer. Men are affected with hemoptysis far more frequently than women, and he reasoned that menstruation serves as a safety valve to ward off hemoptysis. This assumption suggests the advisability of occasional venesection in prophylaxis of hemoptysis in men known to have a tendency to hemorrhage from the lungs. Fever with hemoptysis is not due entirely to the toxic-infectious process; the reabsorption of the extravasated blood may explain a certain proportion of it, if not the whole. It is like the fever with a simple fracture.

Vida Nueva, Havana

March, 1922, **14,** No. 3

*Estimation of Age of Bloody Finger Prints. I. Castellanos.—p. 69.
Large Aneurysm of Arch of Aorta. J. Ortiz Pérez.—p. 73.
Recurrent Laryngeal Paralysis from Stab Wound. A. Frías Oñate.—p. 76.

Estimation of Age of Bloody Finger Prints.—Castellano's two colored plates show the aspect and change of tint of the blood and finger print after intervals of less than ten minutes to one hour to one month and over twelve months, a total of twelve specimens. He has adapted the Tomellini color scale to the Tallqvist scale, making the openings a long rectangle instead of circular, as his plates show.

Beiträge zur klinischen Chirurgie, Tübingen

1922, **125,** No. 3

*Accessory Renal Vessels. G. Petrén.—p. 493.
*Embolic Gangrene. P. Bull.—p. 519.
Perforated Ulcer in Stomach and Duodenum. W. Schmidt.—p. 568.
Appendicitic Abscess; 102 Cases. Dewes.—p. 581.
Appendicitis: 1,000 Operative Cases. H. Steichele.—p. 607.
Contusion of Abdominal and Pelvic Organs. M. Baumann.—p. 624.
*Mammary Cancer. G. H. Feist and A. W. Bauer.—p. 636.
Tetany After Goiter Operations. H. Knaus.—p. 669.
Functional Treatment of Fractures. M. Krabbel.—p. 681.
Solitary Cysts in Kidneys. C. Harms.—p. 688.
The Neurinoma Question. R. Sommer.—p. 694.
Bone Findings After Plaster Dressing. H. Löwenstädt.—p. 721.
Primary Thiersch Flaps Over Large Area. O. H. Petersen.—p. 730.

Clinical Importance of Accessory Renal Vessels.—Petrén's own experience and review of the literature have confirmed the probability of there being some abnormal blood vessel in the kidney when there are repeated attacks of pyelitis and no calculi can be detected with the roentgen rays, the ureters can be normally catheterized, and the kidney pelvis is dilated, while the urine and micturition seem normal. The suspicion of hydronephrosis from an accessory vessel justifies an exploratory incision at once. Unusually profuse hemorrhage at an operation on the kidney can usually be explained by some supernumerary vessel. In operating on the kidney, he adds, it is well to bear in mind that one kidney in every five has some anomaly in its vessels.

Embolic Gangrene.—A similar article by Bull was summarized in these columns, March 18, 1922, p. 855. He warns that pains or functional disturbance or both anywhere in the body with any form of heart disease, should always suggest embolism. The surgeon is practically powerless if the diagnosis is not made until gangrene is under way.

Mammary Cancers.—Feist and Bauer give a retrospective analysis of 128 cases at Prague, and compare their findings with the literature. Over 72.7 per cent. are still cured after three years, but only 33.3 per cent. of those with glands affected at the time. Local recurrence was observed in 17 per cent. The outcome was much less favorable in the cell-poor, scirrhous tumors than in the cell-rich tumors. About 42 per cent. died from internal metastasis, and twice as many of those with scirrhous tumors as of the solid, cell-rich tumors. Only the most extensive excision of the soft parts, especially of the skin and subcutaneous fat tissue, guarantees against local recurrence. In only 31 per cent. of the entire number was the interval from the first discovery of the tumor less than three months. In 72.5 per cent. there was already metastasis in the glands in the axilla, and in 48.4 per cent. the skin was already involved.

Deutsches Archiv für klinische Medizin, Leipzig

May 5, 1922, **139,** No. 3-4

*Gout and Lead Poisoning. A. M. Brogsitter and H. Wodarz.—p. 129.
*Poliomyelitis During Influenza Epidemics. F. Hiller.—p. 143.
*Muscle Tonus. E. Grafe.—p. 155.
*Percussion and Auscultation. P. Martini.—p. 167.
*Primary Oliguria. W. H. Veil.—p. 192.
Metabolism of Water and Salt During Thyroidin and Ovarian Treatment. W. H. Veil and H. Bohn.—p. 212.
*Epinephrin Test in Diabetes. W. H. Veil and Reisert.—p. 235.
*Acute Malignant Degenerative Syphilis. A. Pfeiffer.—p. 245.
Catalase Content of Blood in Pernicious Anemia. H. Korallus.—p. 252.

The Kidneys in Gout and Lead Poisoning.—In the 8 cases of chronic lead poisoning and 6 of gout described here, there was nothing in the history to indicate that there had ever been an acute hemorrhagic nephritis, so the necropsy findings can be ascribed to the lead or the gout. Deposits of urates were found in only 2 cases, but the blood vessels showed pronounced changes in both the lead and the gout cases, as also the glomeruli; the findings in the tubuli differed materially.

Poliomyelitis During Influenza Epidemic.—Hiller reports 10 cases of acute spinal disease during a recent six months, accompanying an epidemic of influenza at Dresden. In 6 cases the clinical picture was that of acute anterior poliomyelitis; in 3 it was more an acute diffuse myelitis, and in another case a sudden paralysis of the bladder was the only disturbance. This case was the only one in which recovery has been complete. The paralysis in the others very slowly retrogressed, and there are still traces of it. His study of the records has shown an epidemic appearance of disease of the central nervous system during the great influenza epidemics of 1712 and 1889-1890. The connection between infantile spinal paralysis and epidemic encephalitis needs further study. The onset differs in these diseases, the meningitis of the former being scarcely noted with the latter, and then is evidently only secondary. In 2 of the cases here described the extensive myelitis had induced the picture of hematomyelia. In a compilation in 1907 of 25 cases of spontaneous hematomyelia, 14 were known to have occurred during or shortly after an epidemic of influenza.

The Muscle Tonus.—In this first article of a series, Grafe discusses the influence of changes in tonus on the total metabolism with organic nerve disease, tabulating under nineteen headings the various findings in sixteen cases.

Research on Percussion and Auscultation.—Martini in this second communication studies the laws and interpretation of tympanitic and nontympanitic resonance.

Primary Oliguria.—Veil explains how primary oliguria can occur, the exact opposite of diabetes insipidus. It may be from organic or functional disturbance in the autonomic nervous system, a vegetative neurosis in the edema line. Some cases of different types are described. In treatment, calcium and iodin must be considered. Iodin is most effectual in daily doses of not more than 0.25 mg. Ovarian extract may be useful to combat a dropsical tendency.

Reaction of Diabetics to Epinephrin.—The findings are recorded in twelve diabetics in regard to the glycemia after a test injection of epinephrin, the vasomotor reaction, glycosuria, acidity of the urine, ketonuria and the carbon dioxid tension in the alveolar air.

Acute Malignant Syphilis.—The acute degeneration affected the liver, kidneys and spinal cord in the three cases described. The syphilis was of twenty years' standing in one case, and the clinical picture with the acute degeneration of the liver was of the acute yellow atrophy type.

Deutsche medizinische Wochenschrift, Berlin

March 31, 1922, **48**, No. 13

Degeneration and Regeneration. Ernst.—p. 409. Conc'n.
*Lawn-Tennis Leg. H. Küttner.—p. 412.
Syphilis in Wetnurses. K. Zieler.—p. 413.
Quinin-Digitalis in Heart Disease. Starkenstein.—p. 414. Cont'd.
Roentgen Irradiation of Cancer. Strauss.—p. 416. Conc'n.
Duodenal Sound in Disease of Bile Ducts. Hecht and Mantz.—p. 418.
*Carbohydrate Metabolism in Liver Patients. Hetényi.—p. 420.
Hyperthyroidism. A. Hellwig.—p. 420.
Complete Differential Leukocyte Count in Puerperium. Fuss.—p. 422.
Modified Form of Twilight Sleep. B. Liegner.—p. 424.
*Desquamation in Urinary Tract in Scarlet Fever. Gonnella.—p. 426.
Course in Dermatologic Technic. M. Joseph.—p. 426. Cont'n.

Lawn-Tennis Leg.—In the midst of a tennis game, a player suddenly stops short on feeling a sharp pain in the calf or farther down on the leg, Küttner states. A muscle or a tendon (the Achilles tendon) has been torn. Usually the player is able to limp off the court, but sometimes has to be carried off. A roentgenogram will confirm the usually certain diagnosis, and will reveal the details in regard to the site and extent of the laceration, as the tendon casts a distinct shadow on the roentgen plate. The roentgenogram is also useful in following the healing process in the tendon or muscle. Formerly such injuries were treated with splints or plaster bandages or even surgical therapy, with operative exposure of the injury and suture. The results were not good, or at least, recovery was delayed, as is shown by Dr. Fane's own experience, since it was nineteen months before he could walk without embarrassment. The only correct treatment is that which lays stress on the rapid restoration of function, does not confine the patient to bed, and induces him to begin walking at once. In mild cases, with a partial rupture of a muscle, this causes no difficulty. With the aid of a cane, the patient should at once make an attempt to walk, which will be painful at first, but after two or three days it will be easier, and after a week a normal gait can usually be reached. In the mild cases, bandages are unnecessary and massage is superfluous. For nervous patients, if the pain is severe, a bandage may be used. For three or four weeks, all violent exercise, including tennis, should be avoided; especially in older persons, as the lacerated muscle or tendon will otherwise break down again. Even in severe cases—total rupture of the Achilles tendon—walking should be begun at once, but here, since the pain is great and the foot is weak, the treatment introduced by Hood in England should be instituted. The patient reclines on a sofa and the injured leg is kept in an elevated position. This suffices to check the hemorrhage, to bring down the swelling and ease the tension. The patient is admonished to walk more and more each day. In the severe cases the bandages may be renewed until the patient feels that he can dispense with them. The prognosis is excellent even when the Achilles tendon is severed, but partial rupture of the muscle heals much more rapidly, though pains in the muscle may be felt for several months.

Carbohydrate Metabolism of Liver Patients.—Hetényi states, after research in more than a hundred cases of various forms of liver disease, that he was unable to find that the blood sugar values fasting were appreciably affected. From his experiments he found that lesions of the liver may affect the blood sugar in two ways: By loss of functioning parenchyma, sugar formation in the liver is lessened, and obstruction of the bile ducts impairs glycogen fixation on the part of the liver. When we apply the rôle of these factors to human pathology, we can ascribe to the first factor only a limited importance. The effect of the second factor was shown in the high blood sugar values in patients with icterus.

Desquamation of the Urinary Tract in Scarlet Fever.—Gonnella's investigations lead him to believe that ordinarily there is a desquamation of the urinary tract in scarlet fever analogous to the desquamation of the epidermis.

April 7, 1922, **48**, No. 14

Encephalitis and Myelitis in Early Syphilis Under Arsphenamin; Recovery Under Mercury and Arsphenamin. Werther.—p. 443.
Treatment of Auricular Fibrillation with Quinidin and Digitalis. W. von Kapff.—p. 445.
*Quinin-Digitalis in Heart Disease. E. Starkenstein.—p. 448. Begun No. 13, p. 414.
Radiothorium. P. Lazarus.—p. 451. Conc'n No. 15.
Bilirubin Crystals in Urine in Icterus. G. Dorner.—p. 453.
Treatment of Rickets. R. Hamburger.—p. 454.
Quick Staining of Intestinal Flagellates. R. Oehler.—p. 456.
Experiences with Neosilverarsphenamin Sodium. Sternthal.—p. 457.
Roentgen Rays in Gonorrheal Epididymitis. J. Wetterer.—p. 459.
Temporary Roentgen Sterilization of Man and Wife. Markovits.—p. 459.
Treatment of Acute Nephritic Lung Edema by Constriction of Limbs. L. Ehrenberg.—p. 460.
Table for Taking of Body Measurements. Schmidt and Weiss.—p. 461.
Course in Dermatologic Technic. M. Joseph.—p. 461. Conc'n.

Quinidin-Digitalis Treatment of Auricular Fibrillation.—Starkenstein states that the use of quinin and digitalis combined is justified if, in connection with prolonged digitalis medication, it is necessary to counteract possible cumulative effects or other dangers from intoxication, and more especially if the heart is already showing toxic symptoms, in which case the toxic remedy is omitted and the other employed as "antagonist." In certain cases the combination may be valuable for the strengthening of the desired therapeutic action of digitalis if an excessive systolic effect opposes the necessary diastolic, or if, owing to narrowing of the coronary artery, the action of digitalis has itself an inhibitive effect. The combination is contraindicated when a quick systolic effect of digitalis is needed, since here quinin serves as an inhibiting antagonist and opposes the desired effect. If, as the result of auricular fibrillation, disturbances in ventricular activity and in the circulation arise, then the combination with digitalis is justified to strengthen the effect of the quinin. Digitalis alone is contraindicated. Cases of cardiac insufficiency with auricular fibrillation should be treated first with digitalis alone; then, after compensation is established, with quinin alone, and if the conditions mentioned above are present, the combination of quinin and digitalis may be used.

Jahrbuch für Kinderheilkunde, Berlin

April, 1922, **98**, No. 1-2

*Oxyuriasis. O. Heubner.—p. 1.
*Fatigue and Irritability. P. Karger.—p. 22.
*Endothelium Permeability. P. Hoffmann.—p. 39.
*Incipient Scurvy. E. Nassau and M. J. Singer.—p. 44.
*The Kidneys in Infants. E. Stransky and R. Kochmann.—p. 63.
*Blood During Loss of Weight. A. Bálint and A. Peiper.—p. 74.
*Porridge in Infant Feeding. B. Epstein.—p. 85.

Oxyuriasis.—Heubner had a minute dendritic ulcer form in the cornea which was about a year in healing, and one ophthalmologist said that he had encountered similar cases in persons with oxyuriasis. Heubner had long been infested with the oxyuris and had been making a special study of his case. Hemeralopia has also been noted in oxyuriasis. His research has demonstrated that the course of this helminthiasis is by six or seven week cycles, probably by new generations. The vermifuge treatment is rendered more effectual by taking onions or garlic for six or seven days beforehand, three or four times a day, 15 or 20 gm. of fresh scraped raw onions or garlic. Then santonin or male fern put an end at

once to all disturbances. A month passed without further signs of the helminths. There can be no question of eradication, however, until two months have passed without signs of the helminths. By wearing tight bathing trunks at night, the pinworms that crawl out of the anus get caught in the fibers of the trunks and can thus be studied. Treatment should aim to attack the new generation as it develops.

Hypokolasia.—Karger has coined this term to apply to a group of nervous affections characterized by early fatigue or other functional weakness of the inhibiting mechanism. The result may be an abnormal exaggeration or an abnormal weakness of inhibitions. This offers a new point of view for treatment of neuropathies. For example, in treatment of anorexia, the child can be got up an hour earlier, so that, from lack of anything better to do, he fills up the time before school by eating. Or repose is enforced after dinner till the clock strikes so the child will linger at the meal instead of rushing through it to run out to play. The aim in treatment is to conquer the inhibitions, not to coddle them. If a child cannot go to sleep unless the room is dark and quiet, combat this, instead of keeping the house quiet.

The Endothelial Symptom in Infants.—Hoffmann refers to the minute hemorrhages in the skin that develop after an elastic band has been applied to the upper arm, drawn tight enough to congest the veins but not to shut off the radial pulse entirely. This was supposed to be peculiar to scarlet fever, but has been found positive in various other infections. Hoffmann's tests on the ten infants suggest that a lack of vitamins may also entail this abnormal permeability of the endothelium of the capillaries. A positive response may thus warn of the necessity for adding accessory factors to the food.

Impending Scurvy.—Nassau and Singer describe a set of symptoms which warn that scurvy is impending. In 50 per cent. of thirty children who later developed scurvy, minute punctate hemorrhages in the skin had been observed, mostly in the face. In 37 per cent., from two weeks to three months before the scurvy, blood had been noticed in the urine although the children seemed to be thriving. Loss of appetite was noted in 50 per cent. on an average of 1.7 months before the scurvy developed. Inability to resist infection is another feature of this prodromal stage, as also the stationary weight.

Renal Function in Infants.—In this fourth report of research in this line, Stransky and Kochmann state that some infants eliminate water by means other than the kidneys in larger amounts than through the kidneys. Epinephrin did not seem to modify kidney functioning but pituitary extract in large doses checked elimination of water by the kidneys; it was thrown off by other routes. Small doses of pituitary extract increased the elimination of sodium chlorid in the urine. The details are given from nine infants and young children.

The Blood During Sudden Losses of Weight.—The experiments reported demonstrate that the blood may be abnormally concentrated or abnormally diluted in infants who are losing weight.

Porridge in Infant Feeding.—The advantages of giving a food less fluid than milk to infants with habitual vomiting are now thoroughly established. The stomach contracts around the more solid food, and this prevents swallowing of air and the expulsive contractions. The infants thrived on the one to three teaspoonfuls of porridge daily (*weizengrützebrei*), kept up for months. In this article Epstein describes experiences with it for infants requiring a little supplementary food or to combat constipation, in which it proved of great advantage.

Klinische Wochenschrift, Berlin

Feb. 25, 1922, **1**, No. 9

Decomposition of Carbohydrates in Animal Organism. Embden.—p. 401.
The Ovarian Cycle and Its Influence on the Changes in the Uterus. R. Schröder.—p. 403.
Dynamics of Dilated Heart; Treatment of Lung Edema. Weitz.—p. 405.
Aluminum Compounds. H. Kionka.—p. 408.
*Ammonium Chlorid in Tetany. Freudenberg and György.—p. 410.
Operation for Congenital Goiter in Infants. E. Melchior.—p. 412.
Erroneous Impressions Produced by Shadow Summation in Roentgenograms. F. Peltason.—p. 413.
Indications from Analysis of Blood in Skin Diseases. E. Pulay.—p. 414.
"Foundations of Medical Thought of Today." O. Wolfsberg.—p. 417.
Permeability of Glomerulus Membrane for Sugar. Hamburger.—p. 418.
Effect of Killed Tubercle Bacilli. H. Selter.—p. 419.
Cholesterin Content of Antigens; Bearing on Wassermann. Frank.—p. 419.
A Case of Retrosternal Goiter. A. L. Molnár.—p. 420.
Adhesions in the Pelvic Abdominal Cavity. P. Lindig.—p. 421.
Treatment of Gonorrhea. F. Rosenthal.—p. 423.
Significance of Phosphoric Acid for Working Muscle. Schmitz.—p. 432.

Ammonium Chlorid in Infantile Tetany.—Freudenberg and György report that by the internal administration of ammonium chlorid (from 3 to 7 gm. per diem) to spasmophilic infants they were able to check the mechanical and faradic nervous hyperexcitability and rid the patients of the manifest symptoms of tetany. The procedure is adapted to practical application, but should be employed only in manifest and not in latent tetany. In one case of postoperative tetany it was shown to be efficacious. In some instances the medication had to be kept up for ten days. It averts the acute danger and time is gained in which to bring about a permanent change in the condition by means of cod liver oil and quartz lamp irradiation. Ammonium chlorid is preferable to calcium chlorid for the reason that it is pleasanter to take. The writers have sometimes found it absolutely impossible to get children to take the required dose of calcium chlorid (from 6 to 8 gm.). The effect of ammonium chlorid is, to be sure, only symptomatic.

Mitteil. a. d. Grenzgeb. d. Med. u. Chir. Jena

1922, **34**, No. 5

*Variations in Freezing Point of Urine. Elfeldt.—p. 567.
Cure of Occipital Cortical Epilepsy After Removal of Projectile. H. Kunz.—p. 591.
"Form of Chronic Paronychia." Tillmann.—p. 596.
"Occult Hemorrhage." H. Peiper.—p. 598.
*Distribution of Leukocytes. H. Ruef.—p. 601.
*Testicles and Electric Responses. Melchior and Nothmann.—p. 612.
*Spondylitis. H. Quincke.—p. 624.
Etiology of Hirschsprung's Disease. K. Vogel.—p. 637.
Behavior of Tissues under Saline. P. Rostock.—p. 644.
Action of Iso-Agglutinins and Isolysins in Blood Transfusion. F. Jervell.—p. 650.
*Agglutination in Diagnosis. J. and J. Vorschütz.—p. 662.
*Water Test in Diagnosis of Gastric Ulcer. F. L. Bonn.—p. 678.

Freezing Point of the Blood.—Elfeldt presents further evidence that the freezing point of the blood depends on a number of factors both renal and extrarenal. His long tabulated series of cases of sound and diseased kidneys, enlarged prostate, etc., confirm the necessity for the subjects being in water balance for tests of the freezing point to be instructive.

Distribution of Leukocytes.—Ruef gives the leukocyte count in blood taken from different parts of the body before and after a major operation. The findings throw doubt on the accuracy of estimation of the total leukocytes from the number found in the peripheral blood. A man with 5,000 leukocytes in blood from the ear may have around 20,000 in blood taken from an internal organ.

Influence of Testicles on Electric Excitability.—In fourteen cases, more or less of the testicles had been removed for various reasons, and in twelve of these fourteen subjects the response to electric tests thereafter was much increased. The results of experiments on dogs coincided with this. The changes in electric excitability seem to be a manifestation of endocrine disturbance. Investigation of the electric excitability may thus throw light on disturbances in the balance of the endocrine system.

Spondylitis.—Quincke has encountered a number of cases in which supposed muscular rheumatism of the back had persisted for several months but the tenderness of the spinous processes finally imposed the diagnosis of spondylitis. In all there had been an acute infectious disease or suppurative lesion not long before. The bacteria invade the bone marrow of the vertebrae early in acute infectious diseases, typhoid, a streptococcus process in a tooth, or other infectious process. This invasion may be the explanation of the pains in the back at the onset of typhoid and other infections. The marrow

process usually retrogresses without leaving a trace, but occasionally it leads to actual spondylitis, and a trauma may first call attention to it. He describes a number of cases, and emphasizes the necessity for greater care of the spine in acute infectious diseases, relieving it of weight bearing and warding off strain and trauma. In one of the cases cited, the spondylitis developed, with fever, two months after defervescence in typhoid.

Agglutination in the Blood in Diagnosis.—Vorschütz states that hemagglutination is identical with bacteria agglutination; also that it is an electric process, and depends on the proportion of globulins. The speed of sedimentation of the erythrocytes also depends on the proportion of globulin.

The Water Test in Diagnosis.—Bonn refers to the differentiation of gastric ulcer from cancer by the difference in the excretion of water and salt. His tests failed to confirm recent statements to this effect.

Monatsschrift für Geb. und Gynäkologie, Berlin

March, 1922, **57**, No. 3-4

Histology of Physiologic Menstruation. K. Lindner.—p. 119.
*Heart Disease and Pregnancy. A. Nelius.—p. 127.
*The Kielland Forceps. A. Mayer.—p. 138.
Twenty Years of Rural Obstetrics. Schroeder.—p. 143.
*Pubiotomy Outside of Pregnancy. W. T. Schmidt.—p. 155.
Pregnancy in Stump of Tube. J. Diemer.—p. 157.
Nonparasitic Cysts in Spleen. E. E. Pribram.—p. 164.
Ancient Books on Obstetrics. O. Feis.—p. 171.

Heart Disease and Pregnancy.—Nelius' data confirm that it is almost impossible to foretell the outcome when a woman with heart disease becomes pregnant. The course may be favorable with a serious valvular defect, and may be grave with an insignificant heart lesion. Women with grave disturbances at one pregnancy may have no trouble at the next one, and so on. In his fifty-three cases in twelve years it was evident, however, that the earlier in the pregnancy compensation failed, the graver the prognosis. With failing compensation, expectant treatment under close supervision may tide through to safety.

The Kielland Forceps.—Mayer concludes his illustrated description of this instrument and its application with the remark that it is not yet to be recommended to the general practitioner. It has proved, he says, very valuable for certain conditions, an actual *vergeisterung* of the forceps procedure. It was described in The Journal, July 9, 1921, p. 142.

Pubiotomy Outside of Pregnancy.—Schmidt has constructed a pelvis dilator which screws the edges of the bone apart when the pubis is divided. With this, the limits for pubiotomy can be reduced to a conjugate diameter of 6.5 or even 6 cm. This operation outside of pregnancy, or very early in a pregnancy, represents a much less serious operation than when done at term, and the dilator insures that the cleft will not close up again.

Wiener klinische Wochenschrift, Vienna

March 23, 1922, **35**, No. 12

*Influencing of Pulse Beat by Sense of Taste. M. Heitler.—p. 263.
Dermatitis During Treatment of Syphilis. J. Klaar.—p. 266. Conc'n No. 13, p. 297.
Angioma in the Deep Neck Musculature. H. Finsterer.—p. 269.
A Method of Staining of Reticular Fibers. R. Maresch.—p. 270.

Influencing of Pulse by Sense of Taste.—Heitler reports the results of research which apparently demonstrate that the pulse beat can be modified by the mere taste of certain foods, drugs, beverages and condiments.

April 6, 1922, **35**, No. 14

*The Appendix and the Adnexa Uteri. H. Thaler.—p. 311.
Treatment of Febrile Abortion. E. Mauthner.—p. 315.
Neo-Silver-Arsphenamin. K. Ullmann.—p. 316.
*Childbirth After Death of Mother. Strassmann.—p. 322.
Simple Blood Staining Method. J. Hickl and N. Jagić.—p. 323.
Meningitis Serosa in Appendicitis Gangraenosa. Steiger.—p. 324.
Old Age and Cancer Formation. F. Orthner.—p. 324.

The Appendix and Affections of the Adnexa Uteri.—Thaler reports that in 777 laparotomies performed during the past eleven years for inflammation of the adnexa in the Women's Hospital in Vienna he found thirty-one cases in which the appendix was adherent to the right adnexa. A study of these thirty-one cases revealed that there was only one instance in which the appendix was diseased and the adherent right tube was healthy. In the remaining thirty cases it could be shown from the anamnesis, the local findings and the behavior of the opposite adnexa that it was highly probable that at the time the adhesions formed the right adnexa were in an abnormal condition. There was no evidence of a direct extension of an inflammation of the appendix to the central portions of tubes still healthy at the time of the formation of the adhesions.

Delivery Thirty-Six Hours After Death.—The macerated fetus measured 24 cm., and conditions showed that it had been expelled by gases within the uterus. The woman of 32 had died two days after a chill and other symptoms had suggested possible criminal abortion.

Zeitschrift für klinische Medizin, Berlin

1922, **93**, No. 4-6

*Physiology and Pathology of Amount of Blood. J. Plesch.—p. 241.
Typhus in Moscow 1917-1920. D. Pletnew.—p. 285.
*The Hemoclastic Crisis. P. Holzer and E. Schilling.—p. 302.
*Idem. W. Worms and H. Schreiber.—p. 323.
*Surface Tension of Urine in Diagnosis. W. Schemensky.—p. 334.
*The Arneth Blood Picture in Scurvy. T. Hausmann.—p. 346.
The Constitution in Relation to Appendicitis. W. Backman.—p. 358.
*Diastase in Blood and Urine in Diagnosis. W. Block.—p. 381.
*Size of Erythrocytes in Different Diseases. L. Csáki.—p. 405.
Influence of Stomach Function on Carbohydrate Metabolism. N. Roth and Z. Ernst.—p. 417.
*The Prognosis in Kidney Disease. S. Litzner.—p. 424.
*Acute Nephritis without Albuminuria. L. Mayer.—p. 460.

The Total Amount of Blood.—Plesch advises against forbidding meat and salt for longer than six weeks, for any cause, but a protein-poor and salt-poor day once a week is extraordinarily effectual in the chronic diseases of middle age. Nearly all religions make fasting at some time a regular law, but this provision undoubtedly at first was merely for hygiene. His research has provided a base for venesection, fasting, and various forms of dietetic treatment, as he explains. His tables show the blood findings in fifty cases, and the effect of venesection, etc.

Test Hemoclastic Crisis.—Holzer and Schilling noted a positive hemoclastic crisis with liver disease, and with congestion in the liver from heart disease, also often after arsphenamin injections, and with subacidity, but the response was variable in infectious diseases. The findings with various tests in fifty-one patients are tabulated. Peptone had a similar action, the number of leukocytes running up in the healthy, and dropping when there was liver disease.

The Hemoclastic Crisis.—Worms and Schreiber report thirty tests on twenty-five patients. They regard the leuko-Widal, as they call the test, as indicating merely a change in the distribution of the leukocytes. The response is not very constant or reliable, and can be depended on as an important clinical symptom only when the reaction is intense or there are special circumstances. The reaction is not proportional to the severity of the liver process, or its nature, and a negative response does not exclude liver disease.

Surface Tension of the Urine in Prognosis.—Schemensky was surprised at the close parallelism between the stalagmometer curve and the clinical course in his latest series of nine cases of acute articular rheumatism, glomerular nephritis, and tuberculosis of the lungs. In one other case of nephritis the stalagmometer quotient has kept high although the disease has long been progressively improving; no explanation of this behavior can be discovered. It is possible that the apparent cure of the nephritis in this instance may be deceptive.

The Blood Picture with Scurvy.—Hausmann classifies the leukocytes by the Arneth differential count in scurvy, specifying some characteristic changes, reduction in numbers of neutrophils, and absence of features suggesting infection.

Amylase in Diagnosis.—Block regards the amylase (diastase) in blood and urine as an aid in the diagnosis of the most diverse pathologic conditions, as he describes, with nearly four pages of bibliographic titles set solid.

Size of Erythrocytes.—Csáki has often noticed that the size of the erythrocytes seemed to correspond always to the hemoglobin percentage. Any change in one was accompanied so promptly by a corresponding change in the other that he is inclined to believe that the red corpuscles can regulate their own hemoglobin content. With nephrosis, there is microcytosis, probably from the increase of salt in the plasma. With nephritis, on the other hand, the size of the erythrocytes is not modified.

Prognosis of Kidney Disease.—Litzner's thirteen pages of tabulated details of 75 cases of nephritis allow retrospective analysis of the probable outcome. The more intense the hyposthenuria, the nearer the end. Some with arteriosclerotic contracted kidney survived for many years, up to decades. The prognosis at the time in the 75 cases was correct in all but 5; in one of these it was too favorable, in the others too unfavorable. His tables list fourteen kinds of details.

Acute Nephritis Without Albuminuria.—Two cases are described. In one the tuberculous young man was in good condition when he suddenly developed acute glomerular nephritis, with anuria and dropsy, but no albumin for a week. Then came slight albuminuria, and death the eighteenth day. The acute nephritis without albuminuria was mild and transient in the other young man.

Zentralblatt für Chirurgie, Leipzig

Feb. 25, 1922, **49,** No. 8

Appearance of Tetany After a Gastro-Enterostomy. Baumann.—p. 250.
*Operation for Postoperative Jejunal Ulcer. H. Alapy.—p. 253.
Suprarenal Extirpation and Epilepsy. E. Heymann.—p. 255.
Technic of the Henle-Albee Operation. J. Elsner.—p. 257.

Operation for Postoperative Jejunal Ulcer.—Alapy (Budapest) recommends, in cases of postoperative peptic jejunal ulcers that arise after gastro-enterostomy on account of a constricting duodenal ulcer, that normal anatomic conditions be restored by excision of the jejunal ulcer, resection of the anastomosis loop, with end-to-end suture, plus pyloroplasty.

Casopsis Lekaruv Ceskych, Prague

March 4, 1922, **61,** No. 9

Notes on Internal Medicine at London. B. K. Prusik.—p. 177.
Technic of excochleation and Cauterization of Cancer of Uterine Cervix. A. Micka.—p. 182.
*Coexistence of Different Species of Malaria Parasites. E. Sieber.—p. 184.
Otosclerosis and Chronic Progressive Loss of Hearing. Goldmann.—p. 186.

Coexistence of Different Species of Malaria Parasites.—The second species is less resistant than the old strain. Syphilis appears in a patient with malaria at first with very marked symptoms, which however diminish. The Wassermann reaction remains negative in the spinal fluid, while it is positive in the serum. The low percentage of parasyphilitic diseases in countries infested with malaria may be in connection with this fact.

March 11, 1922, **61,** No. 10

Analysis of Immunity by Partial Antigens. J. Jedlicka.—p. 201. Conc'n No. 12, p. 252.
*Effect of Epinephrin on Fibrinogen in Blood. F. Vanysek.—p. 204.
Acute Myeloid Leukemia. E. Zeman.—p. 207. Conc'n No. 12, p. 255.

Amount of Fibrinogen in Blood After Injection of Epinephrin.—The fibrinogen increases early and quickly, except in cases with alimentary glycosuria.

March 18, 1922, **61,** No. 11

*Treatment of Postencephalitic Parkinsonian Syndromes. K. Henner.—p. 233.

Treatment of Postencephalitic Parkinsonian Syndromes by High Doses of Sodium Cacodylate.—Henner confirms the good results obtained by Bellarmin Rodriguez and Souques. Doses up to 2.6 gm. (!) were tolerated, when injected intravenously in a 50 per cent. solution, though Souques published some untoward results. Henner considers these injections as the treatment of choice.

March 25, 1922, **61,** No. 12

*Ability of the Young to Produce Precipitins. F. Luska.—p. 249.

Ability of Young Individuals to Form Specific Precipitins.—A perfect parallelism could be demonstrated in young rabbits between the H ion concentration of the serum, the flocculation of the serum by small amounts of alcohol, and the formation of specific precipitins. In very young rabbits with a p_H smaller than 7, the flocculation required more alcohol and no specific precipitin formation could be obtained by injections of horse serum. The increase in p_H was not due to the injections, as it occurred in the untreated controls too, but not in the mother of the rabbits serving as positive control. The increase of the ability to flocculate with age points to Ruzicka's theory of the hysteresis of the protoplasma. The impossibility to find specific precipitins in rabbits 4 to 5 weeks old means only that it is not possible to demonstrate their presence by the methods now used.

Finska Läkaresällskapets Handlingar, Helsingfors

March-April, 1922, **64,** No. 3-4

*Xanthosarcomas in Tendon Sheaths. A. Krogius.—p. 102.
*Chronic Stomach Disease. R. Ehrström.—p. 122.
*Arteries in Kidneys and the Blood Pressure. A. Wallgren.—p. 138.
*Lack of Water in the Tissues. R. Ehrström.—p. 152.
The Evolution of Pediatrics. W. Pipping.—p. 155.
Influenza at Helsingfors, 1918-1921. H. Sundelius.—p. 172.
Tuberculosis in Rural Districts. S. Savonen.—p. 186.

Xanthosarcomas in Tendon Sheaths.—In connection with 4 cases personally observed and one of multiple xanthoma, Krogius reviews the history of these growths, and protests against the general assumption that they are comparatively benign tumors. Of the 93 cases compiled by Tourneaux in 1913, the finger was the site of the lesion in 48, the hand in 12 and the forearm in 6; 19 were on the foot and one on the leg. The age ranged from 6 to 80. These tumors may grow very slowly and be stationary for years, and then start to sudden rapid growth, or they may be malignant from the first. Those on the fingers have seemed to be the most benign while those on the forearm, hand and foot seemed most malignant. In one of his cases there was local recurrence a year after removal of the tumor in the foot. In 6 of the total 93 cases there was metastasis in lungs, liver, etc., and recurrence was known in 21. He reiterates that the general assumption that tendon sheath tumors are benign growths must be abandoned, except for the small ones on fingers. All others demand prompt removal, and if adjacent tissues are involved, testifying to extreme malignancy, amputation should be considered as for malignant disease in general.

Chronic Stomach Disturbance.—Ehrström remarks that notwithstanding the roentgen rays, the stomach tube and the findings at operations, there are certain cases of stomach disturbances in which no explanation can be found for the patient's complaints. On the other hand, grave organic lesions may develop without subjective symptoms. Krogius' compilation of 129 cases of perforation of a gastric ulcer included 15 in which the perforation was absolutely the first symptom to call attention to the stomach, and 8 in which there had been subjective symptoms for only from one to four weeks, although in some the ulcer was hard and evidently of long standing. With symptoms typical of ulcer, the operation may show the stomach apparently intact; gastro-enterostomy, however, cures the symptoms. The disturbance seems to be a chronic intermittent dyspepsia. (A similar article was briefly mentioned on page 88.)

The Arteries in the Kidneys in Relation to the Blood Pressure.—In the 128 cadavers in which Wallgren paid special attention to the renal arteries, nothing was found which conflicted with the assumption that the severe changes in the kidney vessels were due in large part to the high blood pressure that had prevailed during life. There was nothing to prove that the arteriosclerosis had preceded the hypertonia.

Lack of Water in the Tissues in Relation to Acetone Elimination.—Ehrström noticed in a case in 1906 that after a period of profuse vomiting there was a strong odor of acetone on the breath. It subsided after saline infusion. Other experiences of the kind since have confirmed the connection between the condition of water deficit entailed by profuse diarrhea, repeated vomiting, etc., and the appearance of acetone in the breath and urine. In fever cases with much acetone, his investigations always revealed that there had been unusually small intake of fluids. Increasing the

intake of fluids seemed to reduce the acetone. This sequence explains also the acetonuria in the insane refusing food; as they refuse food, the intake of fluids is proportionately reduced. The thirst and the polyuria in diabetes throw further light on this connection. Both the water deficit and the acetone excretion are linked with the excess of sugar in the blood, the tissues suffering from the lack of fluids and of carbohydrates. Ehrström's article has already been mentioned, p. 88.

Hospitalstidende, Copenhagen

April 1, 1922, **65**, No. 9

*Influence of Exercise on the Temperature. C. H. Würtzen and C. Holten.—p. 133. Begun No. 7, p. 101.

Influence of Exercise on the Temperature in the Tuberculous.—Würtzen and Holten give 19 pages of the tabulated findings in regard to the stage of the tuberculosis and the fluctuation of the temperature after a 15 minute walk and after a 10 minute and a 5 minute walk, as also in 27 healthy controls. The temperature showed some modification up or down in 52 per cent. of the tests on the normal after the 5 minute walk; in 64 per cent. after the 10 minute, and in 39 per cent. after the 15 minute walk. In the tuberculous, the rise in temperature might occur a little earlier and last longer than in the normal, but the percentage affected was only from 15 to 27 after the 5 minute walk; from 27 to 45 after the 10 minute, and from 59 to 61 per cent. after the 15 minute walk. There is thus no regularity in the behavior of the temperature after exercise, in either sick or well, no definite limit between the normal and the pathologic.

April 20, 1922, **65**, No. 11

*Proportional Size of Lung and Chest. C. Lundsgaard and K. Schierbeck.—p. 173.
Lewandowsky's Nevus Elasticus. C. With and A. Kissmeyer.—p. 181.

The Proportionate Size of the Lung.—Lundsgaard reports that further research on twenty-seven normal adults has confirmed the findings previously published from study of a group of eighteen subjects. From the chest measure during maximal inspiration, maximal expiration, and the middle position, the total volume, the residual air and the medium capacity of the lungs can be estimated and compared.

Ugeskrift for Læger, Copenhagen

April 13, 1922, **84**, No. 15

*Roentgen Ray Therapy of Exophthalmic Goiter. J. F. Fischer.—p. 345. Conc'n No. 16, p. 385.
Puzzling Roentgenograms of Stomach. A. Borgbjærg.—p. 362.
Dermatitis from Fur Dye. C. Rasch.—p. 365.

April 20, 1922, **84**, No. 16

Ulcerative Gastritis. A. Borgbjærg.—p. 375.

Radiotherapy of Exophthalmic Goiter.—Fischer reviews his 490 cases. The improvement realized by the radiotherapy has persisted in the majority during the years since. His entire 490 cases included only eleven men. In 8 cases the thyroid had been previously resected. The interval from the first symptoms ranged from six months to five years in the majority, and the age in all from 24 to 63. Fourteen cases are described with illustrations. The weight increases as the benefit is felt; a gain of 5 kg. is common, and gains up to 10 or 20 kg. have been observed. Sweating and diarrhea were promptly arrested, as also the glycosuria noted in 3 per cent. Tachycardia was the most constant symptom, and this disappeared entirely in 25 per cent. and was materially modified in a further 50 per cent. In the others, the pulse kept at about 100 to 120 but the patients felt well. Exophthalmos was the hardest to influence of all the symptoms, whether treatment was by raying or by operation, but it subsided completely in some. The effect was more pronounced the more recent the exophthalmos. In about a third of the patients, the goiter persisted, although the general condition had been very much improved. In the other two thirds the thyroid returned more or less completely to its normal size.

The soft goiters yielded soonest; the hard first became soft, and then slowly subsided. Recurrence was very rare in private patients, but certain working women had the symptoms return later, and a second course of treatment was given. Four cases are on record in Danish literature in which the patients died after roentgen exposures, and the radiotherapy was incriminated for the fatalities. But Fischer here reports two similar cases of suddenly fatal exophthalmic goiter differing only in that radiotherapy had not been applied. Otherwise the conditions seemed to be identical. All these fatal cases were in the severer forms of exophthalmic goiter, and these forms call for extra caution. In the 30 cases of pregnancy while the women were under observation no influence on the gestation from the radiotherapy could be discovered, and the pregnancy did not aggravate the hyperthyroidism. In the severe cases the cross-fire dose was 3 H units; if this was borne well, then 8 or 10 units a month later. The mild cases were given the latter dose to start with. In mild, rudimentary cases, the radiotherapy usually insured a permanent cure. If the roentgen treatment had not benefited in two or three months, it was considered useless to continue it. He says that the radiotherapy never renders an operation later more difficult. Stationary chronic forms should be given operative treatment on account of the danger of degeneration of the myocardium; radiotherapy is only the second choice in this group. The more recent the case, the greater the chance of cure under radiotherapy, which may be said to be quite harmless.

April 27, 1922, **84**, No. 17

*Cholelithiasis. S. Hansen.—p. 405.

Gallstones.—Hansen declares that it is not a casual happening that there were only twenty-six deaths from appendicitis during a recent twenty-one months while there were forty deaths from cholelithiasis, although the total of cases, 293, was much less than of the appendicitis cases. Appendicitis is treated rationally, the surgeon is called in early, while delay in the differential diagnosis and expectant treatment wastes valuable time with gallstones. In nine of the forty cholelithiasis deaths the patients were in the medical ward. The bile ducts were normal in 43 per cent. of the 293 cases; cancer was found in the gallbladder in three cases.

May 4, 1922, **84**, No. 18

*Diet in Tuberculosis. M. Hindhede.—p. 433.
*Micromethod for Chlorin in the Blood. P. Iversen and N. J. Schierbeck.—p. 454.
*Bangs' Chlorin Micromethod. P. Iversen.—p. 456.

May 11, 1922, **84**, No. 19

Shape of Chest Determines Shape and Position of Stomach. K. Faber. —p. 479.

The Diet in Tuberculosis.—Hindhede has long been the apostle of the advantages of a milk-vegetable diet. His dictum is *"Stinkende ekskrementer* are incompatible with well-being." In this communication he emphasizes that no exception should be made for the tuberculous. Otherwise we handicap and cripple them in their fight with the disease. At Leysin, Rollier has sanatoriums for all purses, and those paying the highest prices are given meat, while in the cheaper establishments the fare, he says, "out-Hindhedes Hindhede." But the statistics show, year after year, that the cures are more numerous and more complete in the less expensive than in the high priced quarters. Rollier told Hindhede that he is convinced that it would be to the great advantage of the tuberculous to drop meat from the menu. But he feared that if he did this his motives would be misconstrued. Hindhede presents further an array of data from various sanatoriums in Switzerland and Denmark, which justify the conclusion, he says, that there is no evidence that a diet rich in meat and fat offers any advantage for the tuberculous.

Test for Chlorids in the Blood.—The Hagedorn and Norman-Jensen micromethod is applied as for sugar in the blood, and the filtrate is tested for chlorin by the Vollhard method. This micromethod is not so simple as Bang's, but comparative tests showed that it is considerably more exact. The technic is described in detail.

The Bang Test for Chlorids in the Blood.—Iversen reports experiences which confirm that the Bang micromethod gives from 1 to 3 per cent. too low values for the chlorin content of the blood.